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THE NEW SYDENHAM SOCIETY.

INSTITUTED MDCCCLVIII.

VOLUME LXVII.

59

THE

COLLECTED WORKS

OF

DR. P. M. LATHAM,

WITH

MEMOIR BY SIR THOMAS WATSON, BART., M.D.

EDITED FOR THE SOCIETY BY

ROBERT MARTIN, M.D., CANTAB.,
FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS; LATE PHYSICIAN TO
ST. BARTHOLOMEW'S HOSPITAL.

IN TWO VOLUMES.

VOL. I.

THE NEW SYDENHAM SOCIETY,
LONDON.

MDCCCLXXVI.

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EDITOR'S PREFACE.

When first asked by the Council of the Sydenham Society whether I would undertake to edit a reprint of the writings of Dr. Latham, I hesitated, somewhat, before giving an affirmative answer.

I hesitated because I was told, in the courteous letter conveying the wishes of the Council, that although they "did not purpose, in the least, to try to modernize the work, or to bring the information up to the present day," still, that it *was* intended the editor should "annotate as might seem needful to prevent misunderstanding."

But my doubting did not last long. For a very little reflection, a few words of conversation with the Secretary of the Society, and my recollection of Dr. Latham's own comments upon commentators (see his preface to this volume) soon convinced me that I might safely undertake the work without endangering its success.

It seemed to me that whatever the additions which might, perhaps legitimately, be made as supplementary to the author's text, and whatever the different interpretations which might, with our present knowledge, be given to some of his subject-matter, still, that the "sense of the author" was always "clear beyond dispute," and would only too probably become unintelligible when encumbered with the *help* of so-called "explanations." A simple reprint appeared to be all that was desirable; and in this case my duties would begin, and my responsibilities would end, with a faithful revision of the press.

In truth it would be hardly possible to add much, of absolutely certain knowledge, to the grand broad outline which Dr. Latham drew of heart disease—its general symptoms and its physical signs. And surely the attempt to fill in that outline with some comparatively minute and unimportant detail, would be as presumptuous, and out of place, as would be the endeavour, on the part of some artist "prentice-hand," to supplement in like manner the simple grandeur of a Raphael cartoon!

Moreover, in the preface to his first series of lectures Dr. Latham writes: "Auscultation" (he is now speaking of the lungs) "is capable, I have thought, of being greatly simplified for practical purposes. At all events, unless it be so, it can never be successfully taught; the knowledge derived from it must be confined to a few physicians of hospitals, and the profession at large can never expect much benefit from its use.

"Whether I have succeeded in accomplishing what I think so desirable, and have cleared auscultation of its mystery in any degree, others must judge. But thus much I can safely say, that the intelligent student, by attending to the few characteristic sounds which I have pointed out, and taking pains to understand their import, and guarding himself against over-refinement, is able in a few weeks to discern the leading truths connected with auscultation, and in a few months to use it and trust it as his safest guide in the diagnosis of pulmonary diseases.

"Such are the objects which these lectures have in view. They do not pretend to teach the clinical student any single thing peremptorily or dogmatically, but only to furnish him with certain aids and assistances by which he may be better able to teach himself."

Again, in the preface to this volume on diseases of the heart he says: "The clinical diagnosis of diseases of the heart owes all the higher degrees of certainty to which it has been carried in our own times, entirely to auscultatory signs. Accordingly it became necessary for me to give some account of their theory and their uses, and I have desired to do it as simply as possible. Their perfect theory, however, lies deeper than our present knowledge, and all the uses of which they are capable must wait to be developed by more and more multiplied observations of the sick.

"But already there is some true light in which these signs may be regarded; and already there is a large extent to which they may be followed and trusted as the faithful exponents of diseases of the heart. And although on this subject doubtless there has been error and mistake, and a good deal has been taken for more certain, and something for less certain, than it really is, so that we have both to learn and to unlearn, yet enough is already known to make the diagnosis of diseases of the heart hardly anything else than a just appreciation of their auscultatory signs."

With such language before me, with protests so earnest and so potent against the dangers of over-refinement, I cannot but think that any poor foot-note of mine, upon, for instance, "presystolic murmurs," would be eminently ill-timed.

Sir Thomas Watson, in the touching biographical notice of Dr. Latham which he wrote for the St. Bartholomew's Hospital Reports of 1875 (with a reproduction of which he allows the enrichment of this volume), has done ample justice to the powers of our author's mind, and to the eloquence and grace of his diction. But I may be permitted perhaps, very briefly, to allude to some of the more especial characteristics of his writing. I would put first of all the breadth of view with which he contemplates every subject he approaches, and with which he includes all the side issues in connection with it.

He is discussing, for instance, the question of albuminuria—"the greatest single pathological fact disclosed during the present century"—and after alluding to the many diseased conditions with which this fact is coincident, and after entertaining the question of the blood being "the common agency by which these multitudinous effects are brought to pass," he goes on to speak of the prior causes leading up to these effects, to be found, he says, in "the habits, the necessities, the misfortunes, and the vices of men," and so arrives presently to touch upon one of the burning questions of to-day, intemperance, and the moral obligation of the physician to aid in the prevention of what is so often incurable.

Again, he is speaking of disease as a great physiological teacher, and straightway he alludes—and somewhat strongly too, as might be expected from one of his exquisitely sensitive nature—to the subject of vivisection.

Let it not be supposed, for one moment, that he absolutely condemns the practice of experimenting upon living animals. He knew far too well how greatly indebted was his profession to a succession of experimenters, from a Harvey to a Hope, for all its certain knowledge of the circulation, to allow of his denying the opportunity for well-considered investigations. It was rather with the wish of elevating the experiments instituted by disease, and of contrasting their perfection with the imperfection of all human attempts to imitate them, that he expresses himself as he does, and gives a somewhat lukewarm approval.

How greatly ought we to respect him for his honesty, his fearlessness, his candid impartiality, his readiness to admit a difficulty, to suggest a doubt, to confess his ignorance.

Take, for example, his mode of handling the subject of the treatment of acute rheumatism with all its complications in Lecture X. How thoroughly and conscientiously has he gone through all the varieties of treatment, by bleeding, by opium, by calomel, by colchicum, by purgatives; how honestly has he contemplated the possibility of the disease wearing itself out on the do-nothing treatment; and how logically does he sum up in favour of what he calls the "compound method" which "while it works with all the means which have been recommended, stops short of what is harsh and excessive in their use, and yet compasses with more certainty the successful result."

And here I shall venture, in anticipation of the objections which may be made to what has been, and what will be called "Dr. Latham's old-fashioned notions of treatment," to give at length from one of his later essays (presently to be reprinted, I trust, together with others of the same date) his own more matured views on this matter of "old-fashioned treatment," of new-fashioned treatment, and of no treatment at all—preferring, as Sir Thomas Watson says, to make him "his own eloquent expositor," rather than run the risk of failing to do him justice by any imperfect summary of mine.

"On my first entrance into my profession, and for some time afterwards, nothing was less intelligible to me than the writings of our great physician. All his discoursings about epidemic constitutions, and stationary fevers, and intercurrent diseases, and the same diseases needing different treatments from time to time, were to me dark and mysterious. And just the same, I am persuaded, is the case with every man who studies medicine; and the more so, the more he finds himself thus early in the presence of real disease, and in the society of those who, like himself, are daily watching it, and ministering to it, and comparing notes about it. For then the mind is at its freshest and its best, and is most apt for observation. It holds strongly to its own conclusions: and why should it not? It takes for absolute truth what has already come to it authenticated by a hundred instances: and why should it not? It is not yet upon the look-out for what may gainsay or invalidate its own well-observed facts concerning diseases and remedies: why should it? Tell, therefore, the student, and the physician of a few years' standing, that there is something more in diseases, and in the effects of remedies upon them, than can be seen and known from any number of individual patients during any given period of time, and he will neither understand you nor believe you. Yet there is something more, nevertheless; and physicians at length come to own it.

"Choose almost any febrile disease you please, and question the experience of honest and well-informed physicians about it, and what it was, and how it was best treated at their own time and place of observation; and you will find them tolerably well agreed. But take this experience and agreement of theirs to determine its nature absolutely, and fix the canon of its treatment for all places and all times, and you will run into a great practical delusion. Still, a man must have lived long enough to see many phases of medical practice, and been himself engaged in it all the while, before he can be in a condition freely to acknowledge what is here implied.

"Take pneumonia. It has been treated by bleeding, and got well. It has been treated by brandy, and got well. It has been left to itself, and got well. And the bleeders, the brandy-givers, and the doers of nothing at all, respectively, have had a vast deal to say for themselves and against their rivals. And which of them are to be our guides and masters in the treatment of pneumonia? None of them for a single day, much less for always. Besides, the treatment of pneumonia happens just now to be a matter of high controversy; and from controversy often comes exaggeration. And exaggeration often does the work of falsehood unawares. Therefore I would willingly have chosen some other instance, but that I wanted such *internal* febrile disease for illustrating my purpose, as, whenever it exists, declares itself infallibly. And since erysipelas well

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served my purpose, because all about it was plain and unmistakeable to the eye, so now pneumonia will do the same, because, of *internal* diseases, it and all about it are best ascertained by the ear.

"Now, we have the best testimony which the ear can afford to the fact that pneumonia has gone through all its processes of disease and reparation, now advancing, now receding, until the lungs have finally recovered the conditions of health, when it had received no formal medical treatment whatever. Again, we have the sure witness of the ear to the same fact, when the pneumonia had been treated by brandy; and yet again to the same fact when it had been treated by venesection.

"Here the means (for even the doing of nothing may be now deemed to exercise a positive influence), the means, I say, and the end, are things so obvious, and are found so closely following each other, that it is impossible not to put down their sequence to the account of natural connexion. And this being the case, and there being such vast odds between doing nothing, giving brandy, and drawing blood, there is no wonder, if the current of a man's experience had run generally in favour of any one of the three, that he should hold one to be absolutely and always right, and the other two absolutely and always wrong.

"No wonder, indeed. But then practical medicine is unlike all other things in the world. It has its own conditions, and they prohibit all such summary conclusions as these. Let a man use his own experience as best he can for the present; but let him not, upon the strength of it, rebuke the experience of all past times, and dictate to the experience of all future; for if he live long enough, nothing is more likely than that he may find himself fallen under his own reproof, and inconveniently confronted by his own maxims. From having been a bleeder he may become a stimulator, or a passive looker-on in cases of pneumonia. He may find himself interchangeably all three in the course of thirty years.

"And what is the explanation of all this? People not over well disposed towards us and our profession (and there are many such) find a sufficient key to the whole matter in the caprice of medical men, and they take this key of theirs and turn the lock, and bar the door against all further question!

'It is neither more nor less,' say they, 'than the caprice of physicians; so let us have done with it and them.'

"But let the world think of us as it pleases, there is a rational practice of medicine nevertheless, and let medical men themselves still be right and wrong by turns, seeing clearly and doing successfully what is at present to be seen and done, yet mistaking the same for something more sure and permanent than it really is; finding (as it were) a fragment of truth, and learning well what it will now bear, and now safely trusting their own weight upon it, let them foolishly deem it a rock and build a castle upon it. Whatever physicians may be, or the world may think of them, there is, I say, a rational practice of medicine nevertheless, and there are causes sufficient to explain its greatest anomalies."

He then goes on to glance cursorily at what these causes are:—an individual man's constitution; the external agencies, good and bad, by which he (or a community of individuals) is surrounded, and by which his "vital being" is affected; and lastly, and more fully, he touches upon the question of "Epidemic Constitution" as also influencing and modifying treatment at different times.

And here again I am tempted, especially just now, and in view of (may it not be asserted?) a change of treatment steadily gaining ground—whether caused by a change in the "Epidemic Constitution" of these later two or three years, or whether by a better, a more just, estimate of the powers, and of the weakness, of alcoholic stimulants I dare not say—I am tempted to give one more extract from the same fertile source.

"All general terms in use among physicians had need to be jealously watched. Even strength and weakness, simple and innocent as they look, have by turns been the marring of us. The terms themselves cannot be dispensed with; and so long as they truly represent (as they always ought) an aggregate of things real, and verifiable in their details, they serve a useful purpose. But, failing this, they become pernicious abstractions. In my time Medicine has been going through a speculative crisis of two opposite kinds by turns; and strength (so-called) has ruled the one, and weakness the other. Beyond all question, during its critical ascendancy, abstract strength cost the world many lives by its practice of blood-letting; and abstract weakness, in its turn, has cost the world many also by its practice of brandy-giving. I have not statistics to show with exactness which of the two has levied the larger mortal tax upon mankind. My impression is that the bad pre-eminence belongs to the latter."

Finally, I would have the readers of this volume ponder well over the* subjoined pregnant paragraph of Sir Thomas Watson, writing of Dr. Latham's account of the Millbank Penitentiary epidemic; I would have them study carefully Lect. XIV., which is devoted to a consideration of the antiphlogistic and reparatory powers of mercury as illustrated by its effects in iritis; and I would have them read once more Sir James Paget's sectional address in surgery, given at the meeting of the British Medical Association at Norwich, in 1874, before they come to any (foregone) conclusion upon so-called "old-fashioned treatment."

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* "One absolute fact which it records is well worth remembrance in the present sceptical mood of some among us as to the value and the virtue of drugs. The disease, whatever may have been its real nature and origin, was at length, after defying almost every other conceivable method of rational treatment, at once arrested in every instance in which mercury was given and pushed to the extent of producing its specific effect upon the gums."

QUEEN ANNE STREET,
August, 1876.

In Memoriam.

DR. PETER MERE LATHAM.*

BY

SIR THOMAS WATSON, BART.

DR. PETER MERE LATHAM was the second of the three sons of Dr. JOHN LATHAM and of MARY, the daughter of the Rev. PETER MERE, Vicar of Prestbury, in Cheshire. Besides their relation of consanguinity, the qualities and fortunes of these two men were in many points so interwoven and similar, that any memoir of the son, in these pages especially, might justly be deemed defective, which did not include some record, however brief, of the father also. Both of them were eminent London physicians in their day; both held in succession the office of physician, first to the Middlesex and then to this great hospital; both were appointed Physicians Extraordinary to the reigning Sovereign; of both of them it may confidently be added that they were men of blameless life and exemplary character. Of the father I had some partial knowledge during my early residence in London; the son, during the whole of my professional life, was my most intimate and familiar friend.

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Dr. JOHN LATHAM then, was born on the 29th of December, 1761, at Gawsworth, in Cheshire, in the house of his great-uncle, the Rev. William Hall, then rector of that parish. He received his early education in the country. In 1778 he was entered at Brazenose College, Oxford; and in 1788 he was created M.D. of that University. In that year also he settled in London, after having practised for two brief periods at Manchester and Oxford. He became a Fellow of the London College of Physicians in 1789; and in the same year was elected physician to the Middlesex Hospital. That office he resigned in 1792, upon his election as physician to St. Bartholomew's. From 1813 to 1819, inclusive, he was President of the College of Physicians. His first London residence was in Fenchurch Buildings, where his son, PETER MERE, was born. In 1795 he moved to the house in Bedford Row, which the well-known Dr. Reynolds then quitted for Bedford Square. Here he practised his profession with immense repute and success, until, at the early age of forty-six, his health utterly broke down under excessive and incessant toil, and he was compelled to retire into the country, as it was thought, to die. He went to an estate which he had purchased at Sandbach in Cheshire; and there, under the beneficent influence of mental rest and pure air, recovered completely, so as to be able to return to London, where he lived, in Harley Street, for twenty years, in better health and more moderate practice than before. He finally left

London for his seat, Bradwell Hall, in 1829, and died there in 1843, from the effects of stone in the bladder, in the eighty-second year of his age.

What I remember of him is chiefly that he was very hospitable; kind and helpful to young physicians; courteous, of winning manners and address; and highly esteemed and popular, both with his patients and with his medical brethren. It has been written of him by the truthful pen of that son who is the chief subject of this memoir, that "he was singularly temperate when temperance was hardly yet thought to be a virtue, he was most pure in life and conversation when to have been otherwise would have provoked no censure, and he was not ashamed to be religious when religion had yet no recommendation or countenance from the world."

His son, Peter Mere, was born on the first day of July, 1789. He was a very delicate child, and was sent for the first rudiments of his education to Sandbach, where he resided with his paternal grandmother, and attended the free school of that town, of which the clergyman of the parish, the Rev. Charles Lockett, was master. About a year later, in 1796 or 1797, he was transferred to the Grammar School of Macclesfield, at that time under the charge of Mr. Davis, the husband of his mother's sister. There he remained until he began to reside at Brazenose College in 1807. He took his M.D. degree at Oxford in 1818, and in the same year became a Fellow of the

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College of Physicians. He had come from Oxford to study medicine at this hospital in 1810. In 1815 he was elected physician to the Middlesex Hospital; and to St. Bartholomew's in 1824. Beaten first from this post, and at length from practice, by persistent and severe attacks of asthma, he withdrew in 1865 to Torquay, where he died on the 20th of last July, having just entered his eighty-seventh year.

That he lived so long was a marvel to all who were aware of his bodily constitution. I have said that in childhood his health was delicate. In mature life, when he was living in London, besides a slight twist in his spine, which tilted one shoulder a little upwards, his lungs were known to be extensively emphysematous, and his paroxysms of asthma by night were so extremely violent and exhausting, that many times he fully expected to die before the morning. Had he remained longer in London it is almost certain that some one of such paroxysms would have been fatal.

He had twice been married; first to Diana Clarissa Chetwynd Stapleton, grand-daughter of Lord Chetwynd; she died in 1825, within a year of their marriage; and secondly, to Grace Mary Chambers, third daughter of Commander David Chambers, R.N. By her he had four children, who all survive him; two sons, both married, Weyland Mere and Philip Arderne; and two unmarried daughters, Diana Frances and Mary Grace, by whom, together with Miss Gooch, who lived with them at Torquay, the daughter of his early friend, Dr. Gooch, he was assiduously and tenderly nursed throughout the whole of his declining years.

As a school-boy he is said to have been idle, and a hater of Latin and Greek. If so, his tastes and habits must have altered greatly in after life; for in 1809, having made two previous failures, he gained the undergraduate's prize for Latin verse at Oxford. The subject was "Corinth." It is worthy of mention, if only in proof that the teaching at Macclesfield had been sound and effective, that his elder brother John and his younger brother Henry, who also were trained in that school, achieved, both of them, while at Brazenose, a similar distinction. One of the unsuccessful competitors for the same prize in 1812, when Henry obtained it, was Arnold, afterwards the famous head-master of Rugby. I was told also by a profound classical scholar, who was possessed with the strange curiosity to read all the printed Harveian Orations, that subsequently to the date of Sir George Baker's, that by Dr. P. M. LATHAM was one of the very few the Latinity of which he could praise. Indeed, his English style bespoke a master of Latin; slightly quaint, perhaps, it might sometimes be, but stately withal, and always clear, vigorous, and exact.

Of the facility in writing Latin verse acquired by the eldest and the youngest of the three brothers ample evidence exists in two pleasing little volumes, the one by John Latham, D.C.L., unpublished, containing "English and Latin poems, original and translated;" the other, published in 1864, by the Rev. Henry Latham, entitled "Sertum Shaksperianum, subnexis aliquot aliunde excerptis floribus."

The poems of the eldest brother—poems of great beauty, humour, and tenderness—were composed under the sore disadvantage of almost total blindness. At the early age of twenty his hopes and promise of success as a barrister were destroyed by a severe attack of ophthalmia, which left him with only enough of sight to guide his steps, but for ever afterwards unable to read a word of writing or of print.

When Dr. LATHAM became a student at this hospital, the three physicians were Doctors Roberts, Powell, and Haworth. It was the custom of that time—before clinical clerks had been heard of in London—for the senior students, especially those who came from the Universities, to attach themselves to some one of the physicians, to watch his practice, and in a certain sense and degree to superintend his patients. Dr. LATHAM so waited upon those of Dr. Haworth. But, anxious to make his study and knowledge of disease as comprehensive as was possible, and to familiarise himself with the puzzling diseases of the skin among the rest, he began, during this period, to attend also the practice of the celebrated Dr. Bateman at the Carey Street Dispensary. There, in 1813, he first met the late still more celebrated Dr. Richard Bright, and contracted with him a life-long friendship. The winter of the end of that year and the beginning of 1814 was a very remarkable one. The Thames was frozen over, and a fair was held upon the ice. The amount of misery, destitution, and disease produced by this long inclemency of weather was enormous; the duties of the Dispensary physicians increased beyond their strength, and were in part delegated to these two young students; who thus first became actual practisers of their future calling, in the highest and lowest garrets and cellars of St. Giles's.

Among Dr. LATHAM'S fellow-students and companions at St. Bartholomew's were Haviland, afterwards Regius Professor of Physic at Cambridge; Monro from Oxford; William Lawrence, already Demonstrator of Anatomy, Henry Earle, and Edward Stanley, all three surgeons to the hospital in the future; Hodgson, subsequently famous as "of Birmingham;" and James "of Exeter." He found the stimulating plan in vogue, by bark and wine, and the mortality great. A controversy was raging there about the value and propriety of blood-letting in fevers. Upon his election, at the age of twenty-six, to be physician to the Middlesex, he resolved to shut up his books, and to try and judge for himself. He was soon led to use bleeding, not from any doctrine then prevalent, but from his own observation. His work, in his new and responsible position, was carried on with uncommon diligence and energy. Living, as yet unmarried, in Gower Street, and dining usually with his father in Harley Street, it was his custom on his way home at night to turn in at the Middlesex to see some of his patients, especially his fever patients; and he generally did something for them,—gave, perhaps, a few drops of laudanum to one, had the shirt taken off and the body sponged of another, or the feet only sponged with warm water. The result of this kind of special, minute, and unremitting care was a notably smaller amount of mortality among his fever cases than among those of another of the physicians.

Towards the close of his incumbency at the Middlesex Hospital—from March, 1823, to May, 1824—Dr. LATHAM was employed, in conjunction with Dr. Roget, in investigating the nature and source of an obscure epidemic disorder then prevailing in the General Penitentiary at Millbank. In 1825 he published an account of this inquiry—his first professional writing.

The book is pregnant with evidence of acute and patient research, and of clear cogent reasoning. One absolute fact which it records is well worth remembrance in the present sceptical mood of some among us as to the value and the virtue of drugs. The disease, whatever may have been its real nature and origin, was at length, after defying almost every other conceivable method of rational treatment, at once arrested in every instance in which mercury was given, and pushed to the extent of producing its well-known specific effect upon the gums.

For four years, dating from the autumn of 1816, Dr. LATHAM delivered annually, in association with his colleague Dr. Southey, two courses of lectures on the Practice of Physic. The manuscript of these lectures is still in existence. Tied up with it are the following notices written by his own hand:—

"In looking over these voluminous papers after the lapse of forty-nine years (viz. in my seventy-sixth year), I am amazed at the pains, and care, and time I must have bestowed in putting them together. I would have committed them to the flames—but I shrank from a deed which was painful. So I again locked them up.—June 1, 1865. P. M. LATHAM."

And again, later—

> "Now, in my eighty-fifth year, I encounter again my century of Medical Lectures, with their scrap of paper tied round. I was again tender towards my own offspring, and again shut them up and locked the box.—Nov. 28, 1873. P. M. LATHAM."

Dr. LATHAM's first project, in the publishing way, after the commencement of his work at St. Bartholomew's, proved abortive. For ten years he had been collecting and arranging materials for, and was about to put forth, a book on Continued Fever. His clinical clerks had been chosen with care, his case-books had, by them, been regularly and accurately kept, and their contents analysed and digested by himself. It appeared that he had bled from the arm one in every four of his fever patients, and leeched nearly all of them, with a mortality of seven in the hundred. All that died of the fever were found to have ulcerated bowels. Then, suddenly—it was just after the first invasion of the cholera—a startling change took place. He no longer dared to bleed any of his fever patients; on the contrary, he was obliged to uphold them. Their skins were mottled with an eruption, and often spotted with petechiæ. So numerous became the deaths, that time could not be found for examining many of the dead bodies. I think he told me that the mortality was doubled.

We know now the solution of this perplexing change. The fever which he had been so long watching was typhoid, or enteric fever; the new cases belonged to a severe epidemic of typhus. At that time the distinction between these specifically different forms of continued fever had not been recognised. His intended book never saw the light.

When he had been eleven years physician to St. Bartholomew's, he began to give those admirable "Lectures on subjects connected with Clinical Medicine," of which the first were published in a single small volume in 1836, and which marked an era in the clinical teaching of this country. Among their incidental good effects was that of commending to our acceptance and study the even then novel theory and practice of auscultation, by substituting for the technical terminology of Laennec, words and phrases more simple and familiar to the English ear. The conscientious discharge of all his hospital obligations was very remarkable. These lectures were given at an early hour, for a special reason, which may best be stated in his own words:—

> "I have desired," he says, "to meet the students before their minds were pre-occupied with other things; that among the interfering demands of other objects which arise in the course of the day, they should not have to catch a moment for that which I consider is the greatest of all—to steal a brief interval between lecture and lecture, and give it to that to which all lectures, and all the knowledge conveyed in all lectures, is but subsidiary and subordinate. I would not thank them for such an irksome, wearied attention; I want them when their minds are fresh; and, therefore, I have always given myself to them when mine is fresh."

As he always gave these lectures, so also Dr. LATHAM visited his patients—in the early morning. One result of this was, that very few of the students, rarely more than ten, went round the wards with him; but these "few" were also "fit;" they were always the most studious men of their time, and among them were many of the most distinguished of his successors.

The *spirit* in which he fulfilled his functions as a teacher may also be best shown by some further quotation from this little volume. After stating that the disordered human body must be the study and the continual care of his hearers, he goes on:—

> "And is it possible to feel an interest in all this? Ay, indeed it is; a greater, far greater interest than ever painter or sculptor took in the form and beauties of its health.
>
> "Whence comes this interest? At first, perhaps, it seldom comes naturally: a mere sense of duty must engender it; and still, for a while, a mere sense of duty must keep it alive. Presently the quick, curious, restless spirit of science enlivens it; and then it becomes an excitement and a pleasure, and then the deliberate choice of the mind.
>
> "When the interest of attending the sick has reached this point, there arises from it, or has already arisen, a ready discernment of diseases, with a skill in the use of remedies. And the skill may exalt the interest, and the interest may improve the skill, until, in process of time, experience forms the consummate practitioner.
>
> "But does the interest of attending the sick necessarily stop here? The question may seem strange. If it has led to the readiest discernment and the highest skill, and formed the consummate practitioner, why need it go further?
>
> "But what if humanity shall warm it? Then this interest, this excitement, this intellectual pleasure, is exalted into a principle, and invested with a moral motive, and passes into the heart. What if it be carried still further? What if religion should animate it? Why, then, happy indeed is that man whose mind, whose moral nature, and whose spiritual being, are all harmoniously engaged in the daily business of his life; with whom the same act has become his own happiness, a dispensation of mercy to his fellow-creatures and a worship of God."

That this happiness was the portion of the lecturer himself, we may hold the perfect assurance.

Of the *method* of his clinical teaching I must still

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make himself the eloquent expositor. He helps the class to learn for themselves:—

> "It is *your* present duty to exercise your observation carefully and unremittingly; and it is *my* present duty to point out the fittest objects, and place them in the light in which they can be most profitably seen.
>
> "If ever the desire to view the beauties and sublimities of nature has led you to ascend some lofty eminence, you have probably taken with you one more familiar with the scene than yourselves, as a guide; but you have still trusted to your own eyes, and your own feelings, to fill you with the delight of the prospect, and tell you what to admire and wonder at; and you have required no more from the guide than to point with his finger, and say, 'See here, and see there.'
>
> "So, in entering this place, even this vast hospital, where there is many a significant, many a wonderful thing, you shall take me along with you, and I will be your guide. But it is by your own eyes, and your own minds, and (may I add) by your own hearts, that you must observe, and learn, and profit: I can only point to the objects, and have little more to say than 'See here, and see there.'"

Under the same title as before, he published in 1845 two more volumes, full of exact observation and valuable precepts, upon diseases of the heart. He had resigned his office of physician to St. Bartholomew's, after seventeen years' tenure, in 1841. In the preface to these lectures he writes:—

> "I would have published other lectures, . . . but an enlarged sphere of duty at the hospital and elsewhere engrossed all my time, and impaired my health, and spoiled my good intention.
>
> "The duty of physician to a great hospital, unless it can be made easy by indifference to its highest obligations, is incompatible with much care of personal health. Therefore, I relinquished my office at St. Bartholomew's, and with it some of the best hopes I had of being useful in my generation."

It is greatly to be regretted that both series of these very excellent and instructive lectures are, and have long been, out of print.

At this period he stood in the foremost rank of London physicians. I do not recollect when his cruel malady first began seriously to hamper his practice. For some time, however, before his resignation of the hospital, a visit to the wards was almost sure to provoke its access. Meanwhile he had never altogether laid aside his pen. There are scattered—I might say buried—in some of our medical newspapers, contributions from him well worthy of perusal and study. I would refer to one paper in particular, on medical education, in the first volume of the *British Medical Journal* for 1864, because it contains an admirable exhibition of the doctrine, always strenuously maintained by him, that we attempt to teach our students too much science, to the displacement of practical knowledge. "The practice of physic," I have heard him say, "is jostled by quacks on the one side, and by science on the other."

He was a slow, self-critical composer, fastidious in settling his diction, and careful above all things that it should clearly convey his meaning. With what success that object was attained, they who may chance to read this memoir have had some opportunities of judging.

When Dr. LATHAM quitted St. Bartholomew's, he presented to the Library of the Hospital between fifty and sixty volumes of his completed case-books; rich, no doubt, with the fruit of his thoughtful and well-trained observation. Some years afterwards he expressed his disappointment that they had not been turned to any account. It was explained to him by his friend and successor, Sir George Burrows, that the more correct classification which had been made of continued fevers, and the remarkable change which had come over the professional mind in respect of the proper treatment of acute disease, and especially in respect of the abstraction of blood, had made it very difficult to bring his clinical records with advantage before the public. Probably, besides these reasons, there was also the want of an adequate and leisure-gifted *vates sacer*. It cannot be doubted that those volumes contain a mine of precious material, which would amply repay the search of any one who, having the requisite talent, might have the privilege of exploring it.

In the parallel which was drawn in a former part of this memoir between the respective careers of the two Lathams, there was one notable breach. The father was for several successive years President of the College of Physicians; that place of honour the son never held. But this, as I believe, was owing to a voluntary abstinence on his part. So long as the President was appointed from among themselves by that irresponsible and self-elected body of eight Fellows, called "The Elects," the burdens of the Presidency might well be deemed by a toiling physician to outweigh even its admitted dignity and advantages. At any rate, Dr. Peter Mere declined to become an Elect when chosen for that post in 1845, dreading, as I know, lest by accepting it he should encounter, as he almost certainly, sooner or later, would have had to encounter, the cares and distractions, with the then somewhat dubious honour, of the Presidential chair.

"Settled by strong conviction in his Christian faith, Dr. LATHAM lived a life of unostentatious but habitual piety." He was withal a charming companion, full of various information, affluent in anecdote, with a keen sense of fun and humour. With this was blended, as is not uncommon, a quick susceptibility of pathetic emotion. I have heard him read Miss Elliott's beautiful hymn, 'Thy will be done,' with a choking voice and tears in his eyes. His letters are treasures of good sense, of lively and epigrammatic comments on men and things, of shrewd and weighty reflections, wise advice, and affectionate greetings.

I find myself writing in terms of unqualified praise; but I am not conscious of wilful exaggeration. If he had faults—as doubtless he had—they refuse to live in my memory. I must paint him as he was to me. I have tried to let him portray himself.

One of the sterling and most prominent features of his character was the same with that of which Sir James Paget, in the ninth volume of these Transactions, has drawn so touching a picture as exemplified in his nephews, the two Ormerods. His conduct throughout life was governed by an abiding and imperative sense of duty; and as a corollary of this temper of mind must be reckoned his love and his habits of order and method. The letters received by him and kept were all arranged in packets, and the substance of each was noted on the envelope. Even in his extreme feebleness at Torquay no book was ever suffered to be out of its place; if no one was at hand, he would rise from his chair with great exertion and replace it. I am permitted by Miss Latham to quote some words of her most interesting letter to myself descriptive of his later condition:

> "Every winter after his retirement to Torquay he suffered more or less from asthma, but after the first four winters, and as his bodily strength diminished, the attacks became less severe. During summer, even up to 1874, he could drive out, walk a little in the garden, and sit under the trees. It was a constant delight to him to look upon the bay with the fishing-boats, the green fields with the sheep, the garden with the work going on in it. He saw few beyond his own family and his immediate friends. All that interested them interested him, and he watched the progress of his friends and medical pupils with pleasure and pride. His books were his chief companions. Wherever he was, in bed or in his sitting-room, his Greek Testament, with Gresswell's Harmony and Bengel's Commentary, were by his side, and were read and studied over and over again. The Gospel of St. John was the Gospel that he especially loved. He knew many chapters by heart in Greek, and would repeat them to himself at night, or before he went to sleep. He did not speak much of holy things, but from words he would let drop one could gather how far he entered into their depth and truth. Arnold's sermons, Keble's, and with others, latterly those of Baldwin Brown, he never tired of having read to him. Any biography of the men he had known, or any account of the times in which he or his father had lived, interested him. And he would often turn to the classics. Shakespeare and Milton were his favourite English poets. He had the articles of the *Times* read to him daily, but his singularly pure, unprejudiced, clear mind shrank from controversy. At last his reading was almost entirely on sacred subjects. He shared all the little pleasures of those about him, and was ready and anxious to help in any good work.
>
> "By nature extremely sensitive, his patience and resignation were very beautiful to witness. In his most acute attacks of asthma no murmur ever escaped him, only touching appeals for strength to bear what it pleased God to lay upon him. He often expressed great thankfulness for all the blessings vouchsafed him, frequently saying 'How happy I am.'

"His old age *was* very happy and peaceful, a waiting for the life to come.

"During the last few years he became gradually weaker, and the attack of asthma that came on after Christmas, 1874, he never thoroughly shook off. In April he rallied a little, but soon failed again, and became almost helpless. When he was too weak to listen to reading for more than a few minutes at a time, he was not happy without those few minutes' reading from the Bible and the favourite sermons. He talked to his children as well as breathlessness would permit, never losing his interest in every thing that concerned them. Every night and morning they gathered round his bed, and he had read some collects from the 'Visitation of the Sick,' with the 'Gloria in excelsis.' At the end of the second collect he always repeated aloud, with uplifted hands, the words 'Life everlasting.' All these last months was a struggle with weakness and difficulty of breathing. He bore it all with quietness, patience, and courage. On the 20th of July he became rather suddenly faint, and in less than half an hour passed gently away, no one being able to tell when he ceased to breathe. He retained his consciousness to the very last, as he had always prayed he might be permitted to do."

If I were called upon to sum up his character in the fewest words, I could use none more fitting than those with which he (anonymously) has commemorated his beloved brother John. He was an "example of that peculiarly English character, the unobtrusive but accomplished and high-minded Christian gentleman."

He had outlived nearly all his contemporaries. Two yet remain who, next to the persons of his immediate family and beyond all others, were those between whom and himself the ties of ancient friendship and mutual affection were, I have reason to know, the strongest. Sir John Coleridge is one of these. Both of us, indeed, are now stranded—if of him I may presume to say so—upon the fast-narrowing sands of time.

Ripe in years as he was, and ready in spirit for the solemn change, his death must long be the subject of tender and sacred regret among the nearest and dearest of his surviving family and friends; nor will his memory soon cease to be reverently cherished throughout a much wider circle.

> " Multis ille bonis flebilis occidit,
> Nulli flebilior quam mihi."

LECTURES

ON SUBJECTS CONNECTED WITH

CLINICAL MEDICINE,

COMPRISING

DISEASES OF THE HEART.

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AUTHOR'S PREFACE.

SOME years ago, I published a small volume containing lectures which I had given at St. Bartholomew's Hospital, with the view of assisting the studies of those who seek the knowledge of disease at the bedside of the patient. I believe they were found useful; and in that persuasion I would have published other lectures with the same object. But an enlarged sphere of duty at the hospital and elsewhere engrossed all my time, and impaired my health, and spoiled my good intention.

The duty of physician to a great hospital, unless it can be made easy by indifference to its highest obligations, is incompatible with much care of personal health. Therefore I relinquished my office at St. Bartholomew's, and with it, some of the best hopes I had of being useful in my generation.

But returning health brought back the recollection of interrupted purposes, and the desire of renewing them, and led me to think again of what I had written or remembered of past experience, if, perhaps, I might yet glean from it a little which would be profitable to others.

Of the lectures now published, some are literally, and some are only in substance, those which were given at St. Bartholomew's; and others have been added to them.

Their subject is, diseases of the heart. For after all that has been written upon it, something, I have thought, is still wanting to bring it within the easy reach of the medical student; and this I have endeavoured to supply.

The treatise of Dr. Hope is very comprehensive. It embraces all that concerns the heart, its physiology, its pathology, and the treatment of its diseases. But the very abundance of its matter has made it a *hard* book to the student, and its style, which is too often controversial, and even disputatious, repels many readers, and has been in some measure a hindrance to its usefulness. Yet it is a great work, and must always hold a

This book is the pr
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high place in the medical literature of this country. Such information as I have to impart, has no aim of superseding either this or any other valuable work upon the same subject, but will rather (I trust) render the student more desirous of consulting it, and more apt to consult it profitably.

Mine is a limited purpose. It is to regard the diseases of the heart only in one point of view, *i.e.* as they appear in the living man. But this one point of view includes the several objects of their clinical diagnosis, and their clinical history, and their medical treatment. These are what I seek especially to illustrate, while I presume an acquaintance with other parts of the subject, and shall only allude to them incidentally as I go along.

The other parts of the subject, indeed, include no less than all that belongs to the morbid anatomy of the heart, the productions and processes which variously alter, or injure, or destroy its organic structure. These are the very things of which clinical observation seeks to know the living signs and the living history and the treatment, both curative and palliative. But these, it is no part of clinical instruction formally to explain; yet, unless there be some previous knowledge of them, clinical experience cannot safely proceed: and, unless that knowledge be kept up and improved concurrently with it, clinical experience can never go on to perfection.

The clinical diagnosis of diseases of the heart owes all the higher degrees of certainty to which it has been carried in our own times, entirely to auscultatory signs. Accordingly it became necessary for me to give some account of their theory and their uses, and I have desired to do it as simply as possible. Their perfect theory, however, lies deeper than our present knowledge, and all the uses of which they are capable must wait to be developed by more and more multiplied observations of the sick.

But already there is some true light in which these signs may be regarded; and already there is a large extent to which they may be followed and trusted as the faithful exponents of diseases of the heart. And although on this subject doubtless there has been error and mistake, and a good deal has been taken for more certain and something for less certain, than it really is, so that we have both to learn and to unlearn; yet enough is already known to make the diagnosis of diseases of the heart hardly any thing else than a just appreciation of their auscultatory signs.

After I have described the auscultatory signs, and endeavoured to show what they are, both in themselves and in relation to other symptoms, and what is their value as guides both to diagnosis and treatment, I may perhaps seem unreasonably to cut short the further description of the heart's diseases.

But as I lectured, so now I write, for one class of students especially. As my hearers were, so now I presume my readers will be, chiefly those who are seeking information at the bedside. To such there is no greater impediment of knowledge than over-teaching. The teaching which they most require is suggestive. They have the realities themselves to learn from, the original *book* to read, upon which all sound instruction is but a commentary. Therefore the commentator should only interpose when and where he is needed, and not after the manner of certain critics, who most *help* us with their annotations where the sense of the author is clear beyond dispute.

A country pastor made one of his flock a present of Bunyan's "Pilgrim's Progress;" and, anxious that he should both read it and profit by it, took care that the copy which he gave him should be one well furnished with notes. Meeting the man some time afterwards, he asked him how he liked the book, and whether he was sure that he understood it; and received for answer, that he both liked it and understood it all well enough, *except the explanations.*

So with students who have free access to the wards of a great hospital, we should not be too ready in describing and commenting upon the ordinary phenomena of diseases which are constantly before their eyes, lest, perchance, they should tell us "that they understand all well enough, except the explanations."

But there is a clinical *history* of diseases of the heart, as well as a clinical diagnosis. By their clinical history, I mean the notice of those conditions, which, whether preceding, accompanying, or following, may be deemed to hold with them some pathological kindred.

Every part, however, of such clinical history is not made out with equal clearness. That which is constructed out of subsequent events, is the most full and complete. Observation has traced back, with fearful fidelity, a long line of formidable and fatal diseases to their pathological parentage in the heart. But that which is constructed of preceding or coincident events, is hitherto less perfect; yet observation has been able to assign to *some* diseases of the heart a sure origin in, and a still continued alliance with, diseases of other organs, or of the constitution at large.

Now it is this last part of their clinical history which is most available to practical purposes: how greatly available, may be shown from the single instance of the ascertained connection of endocarditis and pericarditis with acute rheumatism. These most formidable affections of the heart have been brought within our earlier knowledge and our earlier treatment, and so within the greater probability of cure, by our being fully aware when most to expect them, and then being upon the watch for them. And all this has come from the study of their clinical history, which has stamped their pathological kindred with acute rheumatism.

But there are diseases of the heart which have a clear clinical diagnosis, but no clear clinical history, except of events which follow them; and these are the least amenable to medical treatment. The same signs which notify their existence, declare their incurability. What a gain will it be to mankind, should observation hereafter discover that the conversion of the valves of the heart, and the lining of arteries, into earthy matter or cartilage, has its sure pathological origin in certain forms of disease in other parts, or in the constitution at large, which are both obvious and curable, or in certain habits and modes of living which can be rectified or avoided!

The study of our times has been chiefly to specialise and to localise disease, and it has had very useful results. But it has had a tendency to narrow our views, and to cripple our practice by setting up as many several pathologies within the body as there are several organs. Yet no sooner do the diseases of separate parts come to be treated, than they begin to claim their place in a common pathology. We cannot reach them, and apply our remedies directly to them, in the isolated spots wherein we find them; but if they are to be reached, and treated at all, it must be through the vascular system, or through the nervous system, or through the digestive and assimilative system. For these are the common agents of life and increase, both healthy and unhealthy, and the common channels both of food and of medicine.

Upon the treatment of diseases of the heart, and all that immediately concerns it, these lectures may have the appearance of being unnecessarily prolix. But be it remembered, that they were originally addressed to students, from whom I could not withhold any piece of practical information which they ought to possess, and, when I could not refer them for it to other sources, I was obliged to furnish it myself. And still I consider myself addressing chiefly students, or those who are daily engaged in the obligations and responsibilities of their profession, and who desire to be faithful to them, and so cherish an habitual preference for that knowledge which is useful.

All things should have a consideration bestowed upon them in proportion to their importance: the question is, whether the treatment of diseases has, upon the whole, had as much as is due to it.

During the last quarter of a century, physicians have laboured very hard, and, upon the whole, very profitably. But their labour has been bestowed in unequal degrees, and consequently with unequal success, upon the objects which concern them. Pathology and diagnosis have had much more of their regard than treatment. Thus our knowledge of disease in its essence has been greatly enlarged, and our skill of detecting its present existence and seat in the living body, has been made more exact and sure, while our ability of influencing its progress and events by medicine has not been proportionally increased.

But how has this happened? Is it that the mind, which is best fitted for the study of pure pathology, is naturally averse from concerning itself with practice? One would hope not; but yet it may be so. The things themselves are different, and may naturally enough please different minds. Disease is a thing of itself, and admits of being studied with little reference to other things; and this may suit one mind. The affair of treating it must necessarily suffer admixture with various accidents and circumstances of life, and cannot be conducted without constant reference to them; and this may suit another mind. But however this may be, the fact is certain, that to many eminent physicians, of foreign schools especially, to whom speculatively we owe the most, practically we owe the least. Their lessons of pathology and diagnosis are copious, original, and instructive; their lessons of treatment are brief, barren, and unprofitable.

Yet it concerns physicians, above all men, that theirs should not be a barren knowledge, but that it should claim honour of mankind from a sense of the benefit which they receive from it. Far be it from me to contend, that every piece of pathological knowledge is to be disparaged or rejected, which cannot at once be made subservient to a practical purpose. The knowledge is to be obtained at all events, and kept ready for use, whether the use come soon, or late, or never. Use, however, is the end always to be regarded, as well philosophically as morally. An age of great increase of speculative knowledge in medicine ought, surely, to be an age distinguished by some great practical benefit.

It is much to be lamented that any eminent master of pathology, who, while he is concerned with the nature of disease, has seemed at home, and in earnest, and satisfied with his work, pleased to instruct, and gaining favour for his instruction as he goes along, should come at last to the treatment of disease as to a humbler and less worthy portion of the physician's care. For this ought not to be. Medicine, as it begins to touch upon higher interests, even the interests of life and death, should feel itself in alliance with higher motives than any which can be thought to help and quicken its pursuit as mere science. For now it claims a sort of moral respect in the handling; it calls upon the conscience as well as the intellect, for more caution to avoid error, and more fearfulness of overstepping the truth.

The treatment of diseases, rightly considered, is, in fact, a part of their pathology. What they need, and what they can bear, the kind and strength of the remedy, and the changes which follow its application, are among the surest tests of their nature and tendency.

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ERRATA.

Page 121, line 6, *for* "ammonia" *read* "ammoniæ."

" 124, " 39, *for* "either venæsection" *read* "either in venæsection."

" 184, " 15, *for* "fætor" *read* "fœtor."

" 189, " 7, *for* "fætor" *read* "fœtor."

LECTURES

ON

SUBJECTS CONNECTED WITH

CLINICAL MEDICINE.

THE HEART.

LECTURE I.

THE NATURAL SOUNDS, AND IMPULSES AND RESONANCES OF THE HEART.—HOW THEIR VARIATIONS OF DEGREE AND EXTENT BECOME EVIDENCES OF THE HEART'S DISEASE OR UNSOUNDNESS.

OF the signs by which we judge of the healthy and morbid conditions of the heart, those that are called physical and are immediately referable to the organ itself, convey the most certain information.

"A line drawn from the inferior margins of the third ribs across the sternum passes over the pulmonic valves a little to the left of the mesial line, and those of the aorta are behind them, but about half an inch lower down. A vertical line, coinciding with the left margin of the sternum, has about one third of the heart, consisting of the upper portion of the right ventricle, on the right, and two thirds, composed of the lower portion of the right ventricle and the whole of the left, on the left. The apex beats between the cartilages of the fifth and sixth left ribs at a point about two inches below the nipple, and an inch on its sternal side."*

This is the præcordial region, in which the basis and apex and lateral boundaries of the heart are denoted, and its entire outline is traced in relation to the walls of the chest.

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* Hope on Diseases of the Heart, p. 3.

Within this space we cannot see. But at this space we can listen, and feel, and knock, and so put it to question, whether all be right beneath. And there is no spot of it which does not in its turn make answer to the ear, to the touch, or to the tapping of the finger, and tell something of the organ that lies herein. Hence proceed sounds, some of health and some of disease, which of the two the ear must judge. Hence are conveyed impulses, some of health and some of disease, which of the two the touch must tell.

All this may seem strange at first. But it will seem no longer strange, when we consider that inseparable from the functions of the heart is a certain motion or energy, and that it varies according to its conditions of health and of disease; and that inseparable from this motion or energy are certain sounds and impulses, and that these vary as it varies. Hence these sounds and impulses have natural degrees and qualities, a natural order of succession and a natural limit of extent, which the ear and the touch can appreciate and use as a measure of the heart's health. And hence these sounds and impulses admit of deviations from their natural degrees and qualities, and their natural order and extent, which the ear and the touch can, in like manner, appreciate and use as a measure of the heart's disease.

Now it is evident that our enquiry must begin with the natural and healthy sounds and impulses of the heart. These are the standard of comparison, by which alone we can judge of the unnatural and morbid.

First, then, of its sounds. And here, for the sake of avoiding confusion, let me just mark the distinction between the sounds which reach the ear simply by listening, and those which reach it by help of percussion. Though the ear judges of both, yet are they totally different in the modes of their production. The heart itself produces the former by its own *vital* movements. *We* produce the latter, and the ear is made perceptive of them only by our knocking. The heart contributes nothing but as an inert mass; and what it contributes *as such* is found equally in the dead and in the living. It is the sounds which the heart brings out of itself by its own vital movements, that I wish now to consider. The sounds, which we bring out of the heart by our percussion, I will consider hereafter: for they too carry with them notices of health and of disease, which are neither few nor unimportant.

The sounds, which naturally accompany the movements of the healthy heart, can only be learnt by the practice of listening to them. It is useless to describe them. They are simple perceptions of sense, which no words can make plainer than they are, when the ear has once become familiar with them. It is the same with all common sounds. By describing them you seek to make them known in a different way from that in which they are naturally known. Who ever thought of describing the sound of the wind or the rain except for poetical purposes? I must leave you, then, to be your own self-instructors in the healthy sounds of the heart, and recommend you to be constantly practising auscultation for the purpose on healthy subjects.

But, besides the fact, that sounds of a certain kind accompany the healthy actions of the heart, which each man must listen for and so learn for himself, there is the theory of the fact, or the explanation how these sounds arise. This surely cannot be learnt merely by listening. The fact that it rains or it blows, we may take upon ourselves to decide without the philosophers, because we hear it. But, if we would know how it comes to do either one or the other, if we would understand the theory of winds and showers, we must enquire a little further, and betake ourselves for instruction to those who have examined into such matters.

In listening at the præcordial region, the ear at once perceives two sounds proceeding from the heart,—the one duller and more prolonged, the other clearer and shorter; the one coinciding with the systole of the ventricles and the pulsation of the arteries, the other coinciding with the diastole of the ventricles and the rest of the arteries. Hence it appears that for one pulsation of the arteries there are two sounds of the heart.

But between the two sounds of the heart there is hardly an appreciable interval. The duller sound, which goes for the first, seems to end with a snap, which goes for the second; and then succeeds an interval of repose, which is appreciable enough before the duller sound returns.

The time, thus occupied by the sounds of the heart in their succession and their pause, has been divided and accounted for after this manner:—one-half is filled up by the first sound, one quarter by the second, and one quarter by the pause.

Still, though there be hardly an appreciable interval between them, the ear acknowledges two sounds. And, that they are really two, will appear the more certain, when their efficient causes are found to be different. So much as is either known or plausibly conjectured about these causes I will now briefly state.

About the efficient cause of the first normal and natural sound of the heart there is, I am afraid, a good deal still in debate. After many direct experiments still physiologists do not agree. Pathologists and physicians then may well be pardoned any doubts and difficulties they may have about sounds which are abnormal and unnatural.

It is very plausibly conjectured that the efficient cause of the first sound is pretty equally shared between the muscular structure of the ventricles and the auriculo-ventricular valves, and that both, by the conditions under which they are placed during the systole, directly contribute to it: the muscular structure, by its contraction, giving it length and dulness, and the valves giving it a perceptible sharpness by their extension.

But what of this perceptible sharpness? Here is a new appeal to the ear. Does the ear acknowledge it? Is it indeed a *perceptible* ingredient of the first sound under ordinary circumstances? For my own part I cannot tell.

It is admitted, however, that, in the healthy heart, this sharpness of the first sound is muffled by its predominant dulness. But it is said that *there* it is notwithstanding, and that there are states of the heart which demonstrate both its reality and how it is produced: that, in proportion as the muscular structure becomes attenuated, the first sound loses more and more of its dulness and length, and gains more and more of this sharpness, which is then not merely manifest but predominant, and sometimes exists alone; and again, that in proportion as the muscular structure becomes thickened, the first sound gains in dulness and length, and then that its sharpness is not only muffled, but absolutely absorbed and abolished.

If all this be true, the first sound of the heart is a mixed sound, or rather two sounds so blended together in the healthy organ as to be nearly or altogether indistinguishable, and so to pass for one. Disease, however, is able to analyse them for us, and, presenting them separate to the ear, makes now one and now the other predominant.

But there is yet another condition which claims a part in causing the first sound of the heart.

The muscular contraction of the ventricles already spoken of, as having its share in the efficient cause, is the same which the heart exercises in common with other muscles of the body. But there is said to be, besides, a muscular *tension*, which is peculiar to the heart. This peculiar tension takes place when the blood is poured in from the auricles, and the valves are closed, and the ventricles are filled, and their muscular fibres braced up, and their entire muscular mass becomes for a moment as hard as cartilage. At this moment it is that the tension reaches its acmé and gives a sound. And this sound of muscular *tension* mingles with the sound of the auricular valves, which are then upon the stretch, and the sounds of both mingle with the sound of muscular *contraction* which immediately follows.

If this be true, the first sound of the heart is a compound of three sounds, each having its own separate efficient cause.

This is rather an intricate piece of physiology. Yet it contains (I am persuaded) some truth. But then it looks so like a riddle, and needs so much trouble to understand and explain, that one cannot take it and use it as a ready clue to explore diseases with.

In the first sound of the heart, which is apparently *one*, there may be two or three efficient causes involved, operating *simultaneously*, and producing, in fact, two or three *simultaneous* sounds. Bearing this theory in mind I may find, perhaps, that it now and then helps me a little to explain certain auscultatory phenomena, which attend diseases of the heart. But for daily use I am content to let my ear dictate to my understanding, and to believe, that the first sound of the heart is *one* sound, and that *one* cause is engaged in producing it, viz. the muscular contraction of the ventricles.

Here, at the threshold of our subject, I would make one general remark, which will find its application as we go along, viz. that it is not *all* physiology which can be made useful towards the knowledge and treatment of diseases, but only those parts of physiology which are undeniably true, and not only true, but easily and at once seen to be so. A great deal of what is termed physiology has turned out to be a mistake; and so far as it has got mixed up with our notions of disease (and this has happened to a deplorable extent), it has hindered the progress of practical medicine.

The efficient cause of the second sound of the heart admits of little doubt. Though it take place during the diastole of the heart, yet is it in no way produced by the alterations of form and consistence which the ventricles then undergo. Their relapse from a state of tension to a state of flaccidity has nothing to do with it; but the second sound of the heart results simply from the sudden closure of the sigmoid valves by the recoil of the blood, when it is thrown back upon them from the pulmonary artery and the aorta.

So much concerning the normal and natural sounds of the heart. As to the sounds themselves, since the ear can only become familiar with them by practice, I leave you to be your own instructors. As to their theory, taking the matters of fact and matters of speculation which have been brought to bear upon it, I consider that it is in part satisfactorily made out, and in part only plausibly surmised. In the received theory of the second sound I am content to acquiesce; but I look to future experiments for something clearer and simpler before we can finally rest satisfied of our possessing a true theory of the first.

Of the natural and healthy *limit* of the heart's sounds within the chest something must next be said. It is a preliminary point which some have thought most important to be determined with precision. But no good ever comes from pretending to more precision than the thing itself admits of; and I am sure this matter does not admit of much. The præcordial region, it has been said, defines it. But surely the second sound always exceeds that limit, and is audible also in the course of the aorta and of the pulmonary artery and of the carotids. Indeed, nothing less could have been expected; this sound having its efficient cause in the mechanical closure of the valves which are placed at the entrance of the aorta and the pulmonary artery respectively.

With respect to the first sound, I should be at a loss to mark the exact space within which healthy proportion and healthy structure always required it to be heard, and in neither more nor less. There are so many circumstances, some consistent with health in the largest sense, and some exclusive at least of its disease, which make the systolic sound of the heart more or less extensively audible, that (I am persuaded) two healthy persons would not easily be found in whom it would be heard exactly within the same thoracic space. Whether a man be fat or lean will always make a great difference. In the one it will be kept within the præcordial region, in the other it will be carried beyond it. Fat is so bad a conductor, that where it greatly abounds, it will restrict the sound to less than the entire præcordial region, even to a very small part of it; so that you will not be able to hear the heart further than you can feel its impulse, or further than its apex. But mere skin and bone are such good conductors, that in very thin persons the sound will spread very far beyond the præcordial region, and be heard at any part of the chest to which you apply your ear.

I believe that in most persons of (what is called) a nervous temperament, even when they are under no conscious excitement, the heart's sounds are to be heard beyond the præcordial region, and, under actual emotion, very far beyond it. And I believe too that in persons of this temperament the heart's sounds are apt to be of a higher intonation. One condition, no doubt, is the result of the other. In proportion as the sounds of the healthy heart are more highly intonated, they acquire a greater audible extent. The louder they are, the further you hear them. And it is the very characteristic of a nervous heart to have its sounds both highly intonated and extensively audible.

The greater extent and louder intonation of the heart's sounds may be no direct symptoms of disease or unsoundness in the organ itself: but they may be, and often are, indirect symptoms of disease or unsoundness appertaining to other parts within the chest. Whatever gives more than their natural solidity to the contents of the chest; pulmonary deposits, inflammatory or tubercular; thickened walls of vomicæ, a thickened pleura and fluid within its cavity, aneurismal tumours, and foreign growths and curvatures of the spine; all these, partly from the compression which they exercise upon the lungs from within or from without, and partly from the amount of solid matter appertaining to themselves, give to the sounds of the heart a larger audible sphere within the chest, and exalt their natural intonation.

It is well to be aware of all this. Not that the heart's sounds, by their greater audibility and extent, can do more than intimate the possible existence of some such forms of disease. The diseases themselves are discoverable by their own direct signs, and there is no need of questioning the heart concerning them. Only we should take especial care that what from extrinsic circumstances seems wrong about the sounds of the heart, be not wrongfully brought in evidence against the heart itself.

But, besides the sounds naturally annexed to the motions of the heart in its state of health, there is its impulse.

Now the fact of the heart's healthy impulse must be left entirely to the touch without further description, as that of its healthy sounds was to the ear. But there is a theory of its impulse lying beyond the immediate reach of the senses, which serves physiologists to dispute and doubt and reason about, but not to agree. How many efficient causes, or rather how many various instruments making up the efficient cause, have been spoken of as engaged in producing that single stroke which we feel between the fifth and sixth rib, I will not pretend to say. I confess that no theory of any complex agencies beyond the heart is verified to my apprehension. As the impulse is synchronous with the contraction of the ventricles, and the contraction of the ventricles is surely adequate to produce it, why should we not believe that it does so altogether?

The normal limit of the heart's impulse is somewhat more certain than that of its sounds; the space within which, neither more nor less, healthy structure and healthy proportion require the heart to be felt is more certain than that within which they require it to be heard. But still there are circumstances, and those not inconsistent with health, which interfere with the sensible impulse of the heart, now restricting and now extending it. The same man, according to the varying postures of his body, will alter the place and extent of this impulse. He stands up, and makes it felt just where the apex strikes the chest, at a point between the fifth and sixth ribs, and not beyond it. He leans forward, and makes it felt both at this point and a little above it, and in the direction of the sternum. He reclines upon his back, and renders it almost or altogether imperceptible anywhere. He turns on his left side, and renders it more perceptible than ever, and in a somewhat larger and different space, between the fifth and sixth ribs, and from thence more towards the mamma than the sternum. Again, he turns on his right side, and again he renders the impulse almost or altogether imperceptible.

How all this comes to pass is so obvious, that it needs no explanation. The facts themselves, however, are worth bearing in mind.

Moreover, many of the same conditions, some entirely consistent with health and some exclusive of disease in the heart at least, which make its sounds more or less extensively audible, are found capable of making its impulse more or less extensively felt: such as redundancy and want of flesh, and the proximity of consolidated structures, by a plain and appreciable operation; and such as the nervous temperament, by a more mysterious, but not less certain, influence.

But, besides the sounds and impulse of the heart, which come from its own vital movements, and cease, when it ceases to live and to move, there are other sounds belonging to it,—sounds with which its vital movements have nothing to do, and which are (as already stated) entirely produced by our percussion of the præcordial region. These should rather be called *resonances* than sounds. They tell of solidity and hollowness. And they tell the same equally, whether the man be alive or dead; though our concern with them, as physicians, is only when he is alive.

Take the fifth costal cartilage on the left side, and let a point, midway between its junction with the sternum and its junction with the rib, be the centre of a circle two inches in diameter. This circle will as nearly as possible define the space of the præcordial region, which is naturally less resonant to percussion than the rest. In reckoning thus we suppose the frame-work of the chest fairly proportioned, no chicken-breasted sternum, no curvature of the spine, lateral or anterior, and all the organs within sound, and bearing their due relation of position to each other. Here the heart is uncovered except by the pericardium and a loose cellular texture, and may be said to lie in contact with the walls of the chest; while in the rest of the præcordial region it is covered, and separated from the walls of the chest, by the intervening lung.

In the space indicated, most practical men would (I think) be ready to admit that percussion conveys to the ear a sense rather of less resonance than of positive dulness. The fact is, if the percussion used be but of moderate force you must listen attentively to make sure that the resonance is really less here than elsewhere. It is only when the percussion used is of a force somewhat painful to the patient, that the ear begins to acknowledge a positive dulness.

It is well to be aware, that the erect posture is more favourable than the recumbent for making this dulness or diminished resonance perceptible to the ear; and the instant of exspiration than the instant of inspiration. In the recumbent posture the intervening loose cellular texture is not strong enough still to keep the heart close to the sternum and the ribs, and prevent its receding by the force of gravity. And during inspiration either a larger portion of lung may be brought in front of the heart; or the portion which is always in front of it may be so thickened by inflation as to thrust backward, for the time, more of the heart than it actually covers.

Such are the sounds, the impulses, and the resonances, which belong to the healthy heart. Remember, the sounds and impulses are inseparable from it as a living organ, and are brought out by its own vital movements. And remember, the resonances are only conditionally annexed to it as a passive substance, and are brought out by our percussion.

The short physiological account of them, which has just been given, will probably be found useful to us as we proceed. At all events we may make a platform of it, where we think it will bear us, and tread more cautiously upon it, where we think it will not.

Of the sounds, impulses, and resonances of the heart no other varieties have thus far been mentioned than those of degree and extent. And indeed its impulses and its resonances admit of no other varieties, either in health or in disease. But the *sounds* of the heart admit, moreover, of varieties in *kind*, which will afford abundant matter for consideration hereafter.

But let us clear up the subject as we go along, and first understand how from the sounds, the impulses, and the resonances of the unsound or diseased heart, these being just the same in kind as of the healthy heart, only more or less in degree or more or less in extent, we are able to gather such important intimations concerning the nature of its unsoundness or its disease.

A clearer sound proceeds from a thin heart and a duller sound from a thick heart; a sound of greater extent from a large heart, and a sound of less extent from a small heart. A more forcible impulse is given by a thick heart, and a feebler impulse by a thin one; the impulse is conveyed to a longer distance from a large heart, and to a shorter distance from a small heart.

All this is surely plain enough, and it is undeniably true. Nevertheless, from its sounds *taken alone* and from its impulse *taken alone*, we could come to few trustworthy conclusions respecting the structural condition of the heart. And why? Because its sounds and its impulses are capable of being augmented or lessened, both in degree and in extent, by causes extrinsic to the heart. This has been expressly stated already: and these extrinsic causes have oftentimes a power over its sounds and impulses as great as any which the heart itself derives from diseases of its own. This will be abundantly shown hereafter.

But, happily, sounds and impulses are the interpreters of each other. The true meaning of the sound is tested by the impulse, and the true meaning of the impulse is tested by the sound.

Thus, from a clearer sound, we argue only the probability of an attenuated heart; but we argue its certainty from a clearer sound joined with a weaker impulse. From a stronger impulse we argue only the probability of an hypertrophied heart; but we argue its certainty from a stronger impulse joined with a diminished sound.

When impulse and sound increase together, there is probably no hypertrophy, but the heart is only acting more forcibly from pure excess of nervous energy. When impulse and sound decrease together, there is probably no atrophy, but the heart is only acting more feebly from pure defect of nervous energy.

When the sounds and impulse of the heart are both perceived beyond the præcordial region, they give notice (generally speaking) of dilatation of one or other of the ventricles. If, under these circumstances, sound predominate over impulse, then with dilatation there is either attenuation, or somewhat less than a proportionate increase of its muscular substance. If impulse predominate over sound, with dilatation there is either hypertrophy or somewhat more than a proportionate increase of its muscular substance.

Thus it is seen how much information respecting many, the most important structural changes, which the heart is liable to undergo, may be conveyed merely by the greater or less intensity, and by the greater or less extent, of its sounds and impulses.

But, amid these sounds and impulses, what is the place and what the value of percussion? Wait a moment, and we shall see. For this matter of percussion must first be cleared a little of certain difficulties, which lie in the way of our rightly understanding its diagnostic uses in application to the heart, before we can well see what those uses are.

Call to mind the important distinctions between the sounds proceeding from the heart, which reach the ear from simple auscultation or mere listening, and those of which the ear is made perceptive by percussion. The same distinctions hold good between the sounds of auscultation and percussion, from whatever organ they proceed.

Now there is an auscultation and a percussion of the lungs as well as of the heart.

Auscultation exercises over the lungs and over the heart a peculiar and separate domain, ascribing to one and to the other what is properly its own, and marking it with a distinctive character, both in health and in disease. But percussion holds a mixed domain over both, leaving undistinguishable by any certain mark what naturally belongs to either, both in health and in disease.

The sounds of the heart, caught by mere listening, and made by its own vital movements, are *sui generis*. They cannot be mistaken for anything else but what they are: they cannot possibly be mistaken for the sound of the lungs. And so too the sounds of the lungs, heard by mere listening, and coming from their own vital movements, are *sui generis*. They too cannot be mistaken for anything but what they are: they cannot possibly be mistaken for the sounds of the heart.

But the sounds of which the ear is made perceptive by percussion, whether they be elicited from the heart or from the lungs, are mere degrees of resonance or non-resonance: they have nothing in them which is *sui generis*. Those which respect the heart may be mistaken for those which respect the lungs, and *vice versâ*. Nay! the sounds elicited by percussion from foreign substances which have their accidental growth and seat within the chest are not at all different from those belonging to the lungs and the heart.

Percussion may find the whole præcordial region dull, and much more than the præcordial region. The dull space may extend beyond it laterally, and reach from mamma to mamma; or it may extend upwards, and reach as high as the second or even the first rib on the left side, and thence, spreading beneath the sternum, reach nearly as high on the right. And all this may be caused by the heart enormously enlarged in all its dimensions. The heart, as it goes on enlarging, pushes the lungs aside, and comes itself almost in complete contact with the walls of the chest anteriorly. Still it may not be caused by the heart, but by solidified lung, or by pleural effusion, or by an aneurismal tumour, or by some vast morbid growth. By which of them, however, percussion alone cannot decide.

Thus, from the sameness of its immediate results, when it is applied to test the diseases of organs within the chest, percussion *alone* can teach us little. And so percussion, if we begin with it, is an useless manœuvre. But percussion as an auxiliary, and in its proper place and turn, is worth a great deal. It is so especially with reference to the heart and its diseases.

We must first listen at the præcordial region with our ears, and examine it with our hands. And thus we may learn all that is capable of being known concerning the condition of the heart: the heart may disclose the whole secret of its disease by its sounds and impulses. Or thus we may only learn a small part of what is capable of being known: the heart may only give an intimation of its disease by its sounds and impulses, and we may still want the means of further information. Here percussion is often able to supply all the help that we have need of: it often comes in as an opportune expositor of the disease, and often stamps a certainty upon our diagnosis, which would be utterly unattainable without it.

Whatever forms of disease or unsoundness have the effect of augmenting the general bulk and compass of the heart, lie especially within the reach of percussion, and within the possibility of deriving illustration from it. Diseases which issue in superadded substances, in serum or lymph, or pus or blood, accumulated within the pericardium; forms of unsoundness which consist of thickened muscular structure, or more capacious cavities, or of dilatation with hypertrophy, or dilatation with attenuation, all admit of being better understood by help of percussion.

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LECTURE II.

SOUNDS OF THE HEART DIFFERENT IN KIND FROM ITS NATURAL AND HEALTHY SOUNDS—TO BE CALLED MURMURS.—MURMURS ARE EITHER ENDOCARDIAL OR EXOCARDIAL.—THE GENERAL CHARACTERS OF EACH.—THE ENDOCARDIAL CONSIDERED AS THE SIGNS OF A DISEASED ENDOCARDIUM.—CONDITIONS TO BE TAKEN INTO ACCOUNT IN RELATION TO THEM AS SUCH.—WHAT CONDITIONS HAVE ERRONEOUSLY, AND WHAT HAVE JUSTLY, BEEN THOUGHT ESSENTIAL TO THEIR MEANING, AS SIGNS DIAGNOSTIC OF VALVULAR DISEASE.

OF impulses of the heart we know no other varieties than those of degree and extent: and of sounds brought out of the heart by our percussion (that is of resonances), we know no other varieties than those of degree and extent. But of sounds, brought out of the heart by its own vital movements, we know many other varieties, which are both different in kind from any that are heard in health, and different too from each other. These arise from divers conditions of disease, and so become the evidences of their existence.

This part of the subject, which respects sounds of the heart, different in kind from the natural and healthy sounds, has been rendered unnecessarily difficult by over-refinement. But surely this ought not to be. Any method by which we seek to make things, in their own nature confessedly perplexed and difficult, better understood, should itself be made as little perplexed and difficult as possible. If Auscultation is to be trusted for perfecting our diagnosis of diseases of the heart, auscultation must be simple.

These sounds of the heart, different in kind from the natural and healthy, have obtained many curious names from similitudes they bear to sounds of more familiar occurrence. Thus they have been called the sounds of the bellows, the saw, the rasp, the file; and the whistling and the cooing sound, and the sound of crumpled parchment, and the churning, and the rubbing, and the to and fro sound.

Now all this music or discord (call it which you will) has some reason in it, as we shall find hereafter. But we must leave it for the present, and begin with something less likely to confuse us.

First, then, for the sake of avoiding the constant recurrence of the same epithets, let us agree to designate all sounds of the heart, which are unnatural in kind, by the name of Murmurs. And, inasmuch as they are always produced by conditions found either within the cavities, or upon the external surface, of the heart, either inside or outside of it, let these murmurs be called Endocardial or Exocardial.

The endocardial murmur is not only different in kind from the natural sounds of the heart, but it takes their place, and is heard in their stead. It comes exactly where the first sound, or where the second, or where both sounds should be. It keeps strict time with the systole or with the diastole of the heart, or with both.

The exocardial murmur, too, is different in kind from the natural sounds of the heart. But it does not take the place of them. It is not heard in their stead. In proportion as it is louder, it obscures or overpowers the natural sounds. But the natural sounds are still apt to reach the ear through the exocardial murmur; and, when they do not reach the ear, it is because they are imperceptible under the circumstances, not because they cease to exist.

It would be time and trouble thrown away to dwell long upon these endocardial and exocardial murmurs, with a view of describing what they are in themselves and in contrast with each other. For after all every man must learn them for himself by the teaching of his own ear. Touching, however, our mere perception of them as sounds, there are a few circumstances interesting enough to mention, which may chance to help the ear to a readier acquaintance with them.

Whenever we hear any unusual sound, either for the sake of conveying our notion of what it is to another, or often for the sake of being sure that we have a right notion of it ourselves, we are apt to set about imitating it. Now, any man hearing the endocardial murmur for the first time, as it occurs in the great majority of cases, would be almost sure to try and imitate it with *his mouth*, and what with whistling and blowing, he would presently hit upon something so very like it, as to make him pleased with his own cleverness. But, hearing the exocardial murmur, such as it is in the majority of cases, for the first time, he would never think of imitating it with his mouth; he would rub his hands together or the cuffs of his coat, or take up any two things within his reach—two pieces of thick paper, perhaps—and rub them together, and, what with brushing, and rustling, and crumpling, he would presently bring out a very near counterfeit of the exocardial murmur.

But these murmurs are to be caught quickly, and distinguished surely, and turned to a ready use, only by practice. Yet it gives a previous confidence in the reality of a distinction between them, to know that the endocardial murmur conveys to all ears the idea of *blowing*, and the exocardial murmur the idea of two bodies moving in contact with each other.

It may be further stated among their general characteristics, that the endocardial murmur is most frequently a single sound, being coincident either with the systole or diastole of the heart; yet that sometimes it is a double sound, being coincident with both; but that the exocardial murmur is rarely less than a double sound. Moreover, that the endocardial murmur is commonly more inward and deeper, and further from the ear, and the exocardial murmur more outward, and nearer to the surface, and closer to the ear.

And now for the modes in which these murmurs are severally produced, or their efficient causes.

First, then, as to the endocardial murmur: it results principally, and most frequently, from unusual vibrations communicated to the particles of the blood by obstacles, which it encounters in its passage through the heart. The obstacles which thus set the whole conflict a-going are inherent in certain portions of the endocardial membrane rendered unsound by disease. It is possible, indeed, for the blood, spontaneously, or at least independent of any known obstacle which it encounters, to allow vibrations among its particles from which the true endocardial murmur may arise. Cases showing the fact are not of unfrequent occurrence. They form a class of themselves; and a very interesting class it is, and deserving our separate consideration. At present, however, we will limit our attention to the endocardial murmur, which has its origin in an unsound portion of the endocardial membrane.

The membrane which lines the cavities of the heart is very liable to disease, but not equally so in every part. Where it is thin and transparent, and admits the colour and character of the muscular structure upon which it is spread to be seen through it, it is seldom found diseased; but where it is of a denser structure, either in itself or from an admixture of other structures, whether cellular or fibrous, with its own, it is frequently and often exclusively diseased. This character of a denser texture belongs to it where it forms the tough white circles which surround the apertures of communication between the auricles and ventricles: also where it is reflected upon itself, and forms the loose duplicatures of membrane which are given off, as it were, from the internal surface of the heart, either at the fibrous circles intermediate between the auricles and ventricles constituting the tricuspid and the mitral valves, or at the commencement of the pulmonary artery and the aorta, constituting the semilunar valves.

It is remarkable how curiously disease is apt to limit itself to the spaces just pointed out. Of the fibrous circle between the auricle and ventricle, of the valves which originate from it, and of the tendinous cords which connect the valves with the carneæ columnæ, there will not perhaps be the smallest space free from disease; but the disease will abruptly stop where the tendinous cords cease and the carneæ columnæ begin. The membrane, however, where it covers the fleshy columns of the heart, is not exempt from the possibility of disease; but, when disease actually affects it, it has seldom originated there, but has generally spread from other parts of the same membrane, although (as we have just remarked) it is apt to stop short before it reaches it.

Observe, I here speak of *disease* in the loose sense in which it is commonly taken, the sense, in which a very small part is made to stand for the whole. I mean only its local products and results, not its vital actions and processes, which mainly constitute its essence.

Any material product, then, of disease of the endocardium, a pearl of lymph adhering to it, a loose excrescence hanging from it, any interstitial thickening, any deposit of earthy matter or cartilage, is enough to produce an eddy of the blood, and so give occasion to the endocardial murmur. Hence wherever this murmur exists we are at once led to think of an unsound endocardium; but we cannot at once be sure that it is actually unsound. For the exceptional cases, in which the murmur is coincident with a sound endocardium, are by no means rare. As soon, however, as upon reflection we have reason to believe the endocardium actually unsound, we may be almost sure that it is unsound in some portion constituting a valve. For the exceptional cases are indeed extraordinarily rare, in which unsoundness is found affecting other parts of the endocardium and leaving the valves intact.

Of all parts of auscultation there is none more interesting than the diagnosis of valvular disease by means of endocardial murmurs. The history of its progress to its present degree of completeness is itself most interesting and instructive. I will give a short sketch of it.

And, first, I would remark generally, that, with respect to the physical signs especially which denote disease of the endocardium and its valvular structure, as well as disease of the pericardium, the student, who starts from the level of our present knowledge, has a vast advantage over those who are his predecessors by a few years. He can be at once put in the way of so surely convincing himself of certain truths, that, by a little careful observation, he will soon make them parts of his own knowledge and experience; whereas we were obliged to work them out for ourselves.

Laennec has indeed been in our hands for nearly these thirty years. And Laennec was the great originator of the auscultatory method of diagnosis in its application to the heart more strictly and especially than in its application to the lungs; and without him to show us the way, this rich and ample field of enquiry might never have been known or cultivated at all. But Laennec, in working out his proofs in detail, admitted some capital errors, which had well nigh made shipwreck of the whole discovery for any useful or practical purpose. Such was that error of his which ascribed (what is called) the second sound of the heart to the contraction of the auricles.

Now the mischief did not so much consist in making the auricles contract with a sound, as in taking the sound thus produced *for a notice of time*, to which he referred certain unnatural murmurs, and fixed their seat and determined their import accordingly. As thus; all murmurs coincident with, or immediately consecutive to this contraction of the auricles, *i.e.* taking place of the second sound of the heart, he held to denote disease of the valves which immediately succeed the auricles in the course of the circulation, viz. the tricuspid or the mitral.

You may conceive what errors of diagnosis must have followed the general acceptance of this erroneous matter of fact.

The proof, by experiment, that the auricles have nothing to do with the second sound of the heart, or with any sound at all, was the first great step towards a safer and surer appreciation of the diagnostic value which belonged to endocardial murmurs.

Still we did not get on. It was easy to affirm, from the presence of endocardial murmurs, that valvular disease existed. And the more prudent and more experienced learnt to be content with affirming thus much and no more; while the less wary, who ventured to commit themselves to a diagnosis of the particular valve which the disease occupied were very often wrong.

Still (I say) we did not get on. Still we were striving in vain to reach a more accurate knowledge of valvular disease by means of endocardial murmurs. And the main obstacle to our success turns out to have been another error of Laennec, consisting in a certain fallacious canon which he laid down, and which was for a long time generally accepted upon the warrant of his authority.

The fallacious canon was this, that each cavity of the heart was instrumental, by its contraction, in producing the murmur which proceeded from the injured valve immediately beyond itself. Thus, when the aortic valve was injured, the systole of the left ventricle produced the murmur by forcing the blood through the narrow aortic orifice. When the mitral valve was diseased the systole of the left auricle produced the murmur by forcing the blood through the narrow auriculo-ventricular orifice. And since the first natural sound of the heart came from contraction of the ventricle, and the second sound (as was thought) came from the contraction of the auricle, it was only necessary to ascertain in the place of which of the two sounds the murmur came, that you might be sure which of the two valves was diseased. If in the place of the first, it was the aortic; if in the place of the second, it was the mitral.

But by maturer observation it was found that this canon would not hold, and that mere coincidence of the murmur with the point of time, belonging to the first or second natural sound of the heart would not determine which valve was diseased. When the murmur was in the place of the first sound the disease indeed often turned out to be, where Laennec would have it, in the *aortic valve;* but just as often did it turn out to be, where Laennec would not have it, in the *mitral valve.* And, when the murmur held the place of the second sound, the disease was always in the aortic valve, where it should never be, and never in the mitral, where it should always be, according to the canon of Laennec. Thus the right key was hitherto plainly wanting to the interpretation of the whole matter.

At length there was good reason to believe that the right key was furnished to us by the doctrine of regurgitation; in other words, by the general fact that, under certain conditions of valvular disease, the blood is not only impeded in its course onwards, but that it does, and must in part flow backwards.

Only consider for a moment the proper office of the valves. They are meant (as it were) to keep guard at the orifices of the heart, and throw them wide open to the onward course of the blood, and hold them close-barred against its refluent current. But disease spoils their fitness sometimes for this office, and sometimes for that. In one case it thickens their texture, and hurts their pliancy, so that they cannot fall back and clear the way as completely as they ought, but must leave checks and hindrances when the passage should be entirely free. In another case it shortens and puckers them, and alters their shape, so that they never shut their orifices as they ought, but leave a chink or an aperture when the passage should be entirely closed.

Thus whether the blood be forced onwards or backwards through a narrow passage, a murmur will equally result. The auscultatory sign will be wanting in neither case.

The following are among the prominent facts which suggested, and taught, and established this doctrine of regurgitating murmurs. And it must be owned, that they are sufficiently puzzling and inapplicable upon any other theory.

In numerous well-watched cases, where a single murmur, constantly and uniformly coincident with *the systole* of the heart, had been heard during life, the valve at the entrance of the aorta, and this valve only, was found diseased after death. Here the murmur marked the time of the blood passing *onwards* from the ventricle into the aorta, through an orifice only half open, which should be open altogether. This was no murmur of regurgitation.

Again, in numerous cases, where a single murmur had been heard during life, but constantly and uniformly coincident with the *diastole* and not with the systole of the heart, still this same valve at the entrance of the aorta, and this valve only, was found diseased after death, Here the murmur marked the time of the blood recoiling *backwards* from the aorta towards the ventricle, and partially re-entering it through an orifice only half-closed, which should be closed altogether. This was the genuine murmur of regurgitation.

Again in numerous cases, where two murmurs had been heard during life, one coincident with the systole, the other with the diastole of the heart, still this valve at the entrance of the aorta, and this valve only, was found diseased after death. Of these two murmurs, proceeding from one and the same orifice, the latter was the genuine murmur of regurgitation, and not the former.

It appeared, then, that the aortic valve, in its states of disease, was capable of becoming the seat of two murmurs, one regurgitating and the other not: of either separately in different cases, or of both together in one and the same case.

Yet again, in numerous cases where a single murmur, constantly and uniformly coincident with the systole of the heart, had been heard during life, the mitral valve, and it alone, was found diseased after death, while the aortic valve was perfectly healthy.

But how could this be explained? In its natural course it is during the diastole that the blood passes through the orifice guarded by the mitral valve from the auricle into the ventricle. Here, however, the mitral valve being diseased, the murmur does not mark the time of the blood passing *into* the ventricle by the mitral orifice, but the time of its passing *from* the ventricle by the aortic orifice: yet there was no disease of the aortic valve to cause it. The only material thing, capable of producing it, was still the diseased mitral valve. But how could this produce it? Even by admitting the regurgitation of blood back into the auricle. And the very point of time, at which the murmur takes place, marks this for the cause, and this for the manner of its production.

The same systole of the ventricle which carries the blood forwards into the aorta, without impediment and without a murmur, where there is no disease, throws it back partially, and with a murmur, into the auricle, through the half-closed mitral orifice, which now admits its regurgitation.

It has been said that the aortic orifice of the heart may be the seat of two murmurs, in consequence of disease of its valve; one systolic, from the blood in its direct course, the other diastolic, from the blood during regurgitation. Either murmur may occur alone in different cases, or both may occur together in the same case. But it would almost seem that the mitral orifice could be the seat of only one murmur, and that murmur the systolic.* Remember, the systolic murmur proceeding from the mitral valve always implies regurgitation.

Yet the condition of disease in the mitral valve is often found to be such as must have raised certain impediment to the passage of blood from the auricle into the ventricle. Why, then, is the murmur, which would indicate such impediment, and which would be coincident with the diastole of the heart, a thing not found in practice, when the mitral valve alone is diseased?

It is probable that, as in health, when the mitral orifice is entirely free, the blood glides from the auricle into the ventricle without any impelling force from behind; so in disease, when the orifice is narrowed, the resistance does not produce any extraordinary effort on the part of the auricle to overcome it. And thus in disease, as well as in health, through a narrow passage as well as a free one, the onward current of blood from auricle to ventricle is still without noise. That it is otherwise with the regurgitating current through the same passage, and that the murmur of the blood rushing backward from ventricle to auricle should be often signally loud, must be owing to the force of the ventricle now engaged in impelling it.

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* The cases are so rare, in which either the diastolic murmur alone, or the systolic and the diastolic murmurs together, can be fairly imputed to the mitral valve, that they are a sort of clinical curiosity.

Thus by listening to endocardial murmurs during life, and noting the exact time at which they occur, whether synchronously with the systole of the heart, or with its diastole, or with both, and then by ascertaining the exact seat of disease within the heart after death, physicians had arrived at a just explanation of the way in which those murmurs are produced. They saw such a mechanism, formed by disease of the several valves, as being played upon by the blood during the vital movements of the heart, must needs have given occasion to the murmurs which they heard; to the direct murmur in one case, to the regurgitating murmur in another, and to both of them in a third.

Now this doctrine of valvular regurgitation, which brought with it a clearer insight into the whole rationale of endocardial murmurs, was pathologically a great step in advance. But in diagnosis it rather seemed a step backward; for it undid much of our former knowledge by convicting it of error. We were constrained to give up much which we once believed from seeing that it could not possibly be true. Our better pathology was for the present sorely puzzling to our diagnosis.

When we heard a loud endocardial murmur during life always accompanying the systole of the heart, and when we often found after death the aortic valve diseased and the mitral sound, and just as often the mitral valve diseased and the aortic sound, our pathological notions were equally satisfied in either case. In the former we acknowledged the sufficient cause of the *onward* murmur, in the latter the sufficient cause of the *backward* murmur, and we acknowledged the systole of the ventricle equally instrumental in producing both. But still we could not tell which was which *during life*, or when the aortic, or when the mitral valve was unsound. The same endocardial murmur, at the same article of time in all cases, could not inform us which it was in any.

But at length we seem to have made a nearer approach to unravel these difficulties of diagnosis, and to discriminate the exact seat of endocardial murmurs during life, as well as understand the mechanism of their production. For this purpose, however, there are more things to be taken into account respecting them than their mere coincidence in point of time with the systole or diastole of the heart.

Besides this coincidence, two general facts have been put forward, as surer interpreters of endocardial murmurs, in giving them a more exact meaning, and assigning them to the particular orifice from which they proceed. The first fact is, that endocardial murmurs are most plainly audible at that part of the præcordial region which is nearest to the orifice from which they proceed. The second fact is, that endocardial murmurs are conveyed sometimes in one direction and sometimes in another, and that the orifice from which they proceed determines in each particular case what that direction shall be.

Of these two general facts, I am more sure of the second than of the first, and have better proof of its practical use. But we will briefly consider them both.

"A line drawn from the inferior margins of the third ribs across the sternum passes through the pulmonic valves a little to the left of the mesial line, and those of the aorta lie behind them, but about half an inch lower down."*

"A horizontal line drawn through (along?) the under edge of the sterno-costal articulations of the fourth ribs will cut across nearly the middle of the length of the mitral valve, when drawn outwards and downwards by its tendinous chords and columnæ carneæ, and pass about two or three lines above that portion of the tricuspid which most nearly approaches it, the latter valve lying underneath the sternum, and the former immediately to its left."†

So much of the sternum as these lines include to the left of the mesial line, and the space they indicate between the lower margin of the third and the lower margin of the fourth sterno-costal cartilages on the left side, may be taken to mark that portion of the præcordial region, behind which lie all the orifices of the heart and a good share of the valvular structures appertaining to them. Now, inasmuch as the several orifices are found at the basis of their respective valves, the pulmonary and aortic orifices must be lower than the first horizontal line, and the tricuspid and mitral orifices must be higher than the second. How nearly, then, must they all approach one another in the mid-space between them both! So nearly, that the mouth of an ordinary-sized stethoscope would surely cover them all within the circle of an inch and half or less. Whichever orifice of the heart be affected, we are sure to find the endocardial murmur here or hereabout. And listening here and here only, we cannot segregate the murmur of one orifice from that of another. What then, if "endocardial murmurs *are* most plainly audible in that part of the præcordial region which is nearest to the orifice from which they proceed!" This general fact, taken alone, cannot help us much in determining which of them is affected in a particular case, when they all lie clustered together at the same, or nearly at the same, part of the præcordial region.

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* Hope, on Diseases of the Heart, p. 3.

† Joy, in Library of Medicine, vol. iii. 258, in a note.

But suppose we raise our ear, or the stethoscope, from this exact spot, and shift it an inch or two higher or an inch or two lower. Higher we may hear the endocardial murmur still, and lower we may lose it altogether. Or higher we may lose it altogether, and lower we may hear it still. Or both higher and lower we may still distinctly hear it. By this procedure we are following the endocardial murmur in the direction it takes after it leaves the orifice from which it is propagated; and we find how various the direction is, upwards in one case, downwards in another, and both upwards and downwards in a third. But still it is the orifice, from which it is propagated, that gives the murmur its particular direction; and this (it is said) may be taken for a general fact.

Accordingly, when the endocardial murmur is conveyed in an upward direction, even above the basis of the heart, and still along the course of the aorta, and further still, as sometimes happens, along the subclavian and carotid arteries, the aortic orifice is its point of departure, and the valve, there situated, is the valve diseased. When it is conveyed in a downward direction, and to the apex of the heart, the auriculo-ventricular orifice is its point of departure, and the valve, there situated, is the valve diseased. And when it is conveyed both in an upward and downward direction, both in the course of the aorta, and to the apex of the heart, then it has two points of departure, and both the aortic and the mitral valves are diseased. Here the murmur, which is *one* to the ear, may be *two* in fact. The two are made one by being both synchronous with the systole of the ventricle. In this case the murmur from the aortic orifice is direct, and that from the mitral is regurgitating. Or the murmurs thus conveyed in different directions, as they are two in fact, may be two to the ear. But then one must be synchronous with the diastole, the other with the systole of the heart. In that case the diastolic murmur comes almost always from the aortic and the systolic from the mitral orifice; and the diastolic and aortic murmur is not direct but regurgitating, and the systolic and mitral murmur is regurgitating still.

The general fact, that endocardial murmurs pass in certain directions according to the seat of the valvular disease, has yet a further interest and use. It helps us some way towards the differential diagnosis of diseases of the same order of valves on the two sides of the heart.

When the murmur, audible in the space between the two horizontal lines above described, is conveyed upwards and beyond the basis of the heart, the disease may be either of the aortic or of the pulmonic valves. The direction that it takes from this point must determine which of the two; for it may take more than one direction. When it is heard passing upwards for the space of two inches, and between the second and third ribs of the right side, then it is taking the course of the aorta, and the disease is of the aortic valve; and still more surely, if it be heard in the carotid arteries. But when it is heard passing upwards between the second and third ribs, not of the right but of the left side, then it is taking the course of the pulmonary artery, and the disease is of the pulmonic valve; and still more surely, if it be not at all heard at the same time in the carotids.

I doubt whether it would be possible to arrive at a differential diagnosis of diseases of the mitral and tricuspid valves from any ascertainable difference in the direction to which the murmur originating from one or the other is conveyed.

It should be remarked, that valvular disease on the right side of the heart alone is a most rare occurrence; and that, when it is found on both sides together, the disease on the left generally so far outruns that on the right, as to have reached its acmé before the other has hardly begun. Hence, in the vast majority of cases, valvular murmurs proceed from the left side exclusively; and, in the few cases, where they proceed from both, those from the left will probably be so much the loudest as to overpower those of the right. And in the still fewer cases, where they proceed exclusively from the right, they are submitted too rarely to our observation for us to be familiar with the peculiarities which belong to them. In truth, almost all our knowledge of endocardial murmurs, proceeding from valvular disease, is derived from our study of those which appertain to the left side of the heart.

Finally, then, is the doctrine of valvular regurgitation, are the notices of time marked by the systole and diastole of the heart, is the fact of sounds being heard more plainly in one part of the præcordial region than another, or the fact of sounds being conveyed in this or that direction within or beyond the præcordial region, forward or backward, with the current of the blood; are all these facts true and stable, and general enough to hold the place of principles? And, if they be, will they bear to be taken, always and without reserve, as the sure exponents of endocardial murmurs, so far as to fix the valve or orifice of the heart from which they proceed? I dare not affirm so much. I do, indeed, still make use of them as principles, but I am less peremptory about the certainty of their application than I was a year or two ago. Often the event has been just as they would indicate. But occasionally it has been contrariwise; and the exceptions I have not always been able to explain without prejudice to the assumed principles.

But we should not be in a hurry to abandon such general facts as these which have often led us right, because they have sometimes seemed to lead us wrong. We should rather suspect the occasional interference of counteracting circumstances, which we do not yet understand. In the history of our profession we meet too often with things utterly worthless capriciously taken up, but sometimes with things really valuable capriciously laid aside.

Among the conditions, which may possibly intervene to turn endocardial murmurs from the direction in which the disease of particular valves would tend to convey them, the following may be mentioned:

1st. The presence within the chest, and exterior to the heart, of substances having a more solid consistence than its natural contents, such as morbid growths of various kinds, or aneurismal tumours, or condensed portions of lung. These are able to conduct the abnormal murmurs, no less than the natural sounds, of the heart, to a greater distance, and in any direction, according to the place they occupy.

2dly. The enlarged capacity of the heart itself, which is the most frequent consequence and concomitant of its diseased valves. The large dilated heart spreads its sounds abroad laterally. And thus, whether the murmur be traced in the course of the aorta, or not at all above the basis of the heart, it is often as loudly audible from mamma to mamma, and every where in front of the chest below the fourth ribs, as in the præcordial region itself; and often even far round towards the left axilla.

3dly. The mere loudness of the endocardial murmur. The abnormal murmurs, as well as the natural sounds, of the heart, are heard to a greater distance in proportion to their mere loudness, and that not only in the directions to which the current of the blood conducts them, but in all directions.

Now, when these three conditions meet; the loud endocardial murmur, itself very widely audible, and the enlarged heart, ready to spread it still further abroad, and some solid substance within the chest ready, according to what its seat may be, to conduct it in any new direction, no wonder that the tendency of a diseased valve to convey and to restrict the same murmur within a particular channel should be sometimes counteracted and disturbed.

To these several conditions I may add a fourth, viz. a peculiar quality of the endocardial murmur, giving it a high musical note. Such a murmur will sometimes refuse to suffer restriction to any certain space within the body. It will even carry itself outwards and reach the ears of bystanders at a short distance.

Touching endocardial murmurs, as the signs of endocardial disease, there remain two more points to be considered. They have been relied upon, not only for fixing its seat in this or that orifice of the heart, but also for estimating its magnitude and the amount of impediment raised by it to the passage of blood, and for determining *the kind* of structural change which it has produced.

The popular notion seems to be, that the louder the murmur the *greater* the disease, and the greater the amount of impediment.

The truth, however, is, that the murmur becomes louder as the disease and the impediment increase only *up to a certain point,* and then, that it becomes less and less loud as they go on to increase beyond this point. Thus the disease and the impediment still increasing may, and sometimes do, reach a point at which the endocardial murmur ceases thenceforth, and altogether, as long as life remains.

Two individuals of unsound heart died within a few days of each other. I witnessed the symptoms of their disease during life, and after death I saw what that disease actually was. In both the right ventricle was dilated, and the left was dilated and hypertrophied; and in both the mitral valve and the aortic valve were diseased. But the valvular disease, and the impediment resulting from it, were far greater in one case than in the other. In the one the auriculo-ventricular orifice was so narrowed as only just to admit the little finger, and the aortic orifice was only just not closed. In the other there remained a tolerably free space for the passage of blood through both orifices.

Now in the first case during life there was no endocardial murmur at all; while during life in the second there was a loud bellows-murmur audible in the whole præcordial region, and far on either side of it, and beyond it upwards in the course of the aorta.

All this seems to admit of easy explanation. When endocardial murmurs result from diseased valves, there are two agents engaged in producing them, viz. the mechanical obstacle which the blood encounters, and the blood itself. It is from unusual vibrations among the particles of the blood that the unusual sound immediately proceeds; but it is the obstacle which sets the conflict agoing. Now the sound must be in proportion to the vibration; and the vibration is in proportion to the amount of the obstacle and the quantity of blood and the rate at which it circulates taken together. Thus the endocardial murmur becomes louder and louder while the valvular disease is upon the increase, as long as the heart by its increasing thickness is still able to force a large current of blood through a moderately contracted orifice. But the endocardial murmur becomes fainter and fainter, and at length ceases altogether, as the valvular disease, by its further increase, goes on still to narrow the orifice, and the ventricle with all its increasing thickness can only force the blood through it in a more and more slender stream.

Further, there is, or, rather, perhaps there was, a notion that endocardial murmurs have wonderful diagnostic secrets wrapped up in their varieties of *kind* and *quality;* and that all those similitudes, which they are in different cases found to bear to the sounds of the bellows, the saw, the rasp, the file, or to whistling or cooing, were worth our serious study, inasmuch as they severally denote the very *kind* of structural change which a diseased valve has undergone, whether it be converted into cartilage or earthy matter, into matter hard or soft, or rough or smooth. Experience, however, does not countenance the belief, that the *kind* of endocardial murmur follows the *kind* of endocardial disease.

But upon what do the varieties of murmur which accompany valvular disease really depend? Go into the wards of this hospital, where there are always numerous cases of diseased heart ready for observation, and perhaps you will find three or four or half a dozen patients, in whom the endocardial murmur is strongly marked, and has those accompanying conditions (you know what they are) which make it highly probable, not only that the disease is valvular, but valvular disease of the same orifice in them all. But the murmur will have as many varieties as there are patients; yet it will be characteristically endocardial in all, while it is different in each.

Then go into the museum, and scrutinise half a dozen specimens of disease in a particular valve. Let it be the same valve which you believe to be the seat of disease in the patients whom you have been examining in the wards. In all the specimens you will find the orifice to which the valve belongs obviously narrowed, but so narrowed as to leave the stricture of different size and different form in each. Thus the orifice will have become a pipe or a funnel or a chink in the several cases. In one it is direct, in another tortuous; in another it has a bar drawn across it, and has two apertures; in another it has several bars drawn across it, and is cribriform.

No wonder then will any longer remain, that in the wards of the hospital the patients whom you believe to have the same valve of the heart diseased should all present the characteristic endocardial murmur, but each a different variety of it. The murmur, with its accompanying conditions, denotes the valvular impediment and the orifice it occupies, while its varieties arise from the different sizes and shapes of the orifice through which the blood has to pass, and the rate at which it passes.

Upon the whole, my persuasion is, that no practical good has come from curiously naming, and noting, and multiplying endocardial murmurs. The *mere* murmur can only tell me whether it proceed from the inside or from the outside of the heart. For more than this I cannot trust it. But in telling me this, it tells that which I have no possible means of knowing without it.

Having determined that the murmur is endocardial, and proceeds from within the heart, if I desire to know, moreover, whether it arise from valvular disease, and from valvular disease on which side of the heart and at which orifice; then for this more exact diagnosis I must add to the mere endocardial murmur a reckoning of the time at which it occurs, and a reckoning too, of the space within the præcordial region at which it is chiefly heard, and of the direction in which it is conveyed.

And if (what is most important of all) I aim at a diagnosis of the endocardial disease in respect of its essence and nature, then to the mere sound, and its time and its place and its direction, I must *add* a reckoning of the actions and sufferings of the constitution at large which precede it and attend upon it. These, which are the highest considerations of all, are reserved for their proper place.

In the mean time I would observe of the mere murmur, that nothing would be lost in propriety of language, and much gained in simplicity, if the term *endocardial* were made to include all its ordinary varieties which proceed from within the heart, and were the single term in common use; and if the fantastic similitudes which have been mentioned were only now and then employed to help us in describing something extraordinary, it would be all the better.

LECTURE III.

ENDOCARDIAL MURMURS CONTINUED.—THEIR ORIGIN FROM VALVULAR DISEASE SOMETIMES DOUBTFUL.—MAY PROCEED FROM OTHER FORMS OF MECHANICAL IMPEDIMENT.—DEFORMED CHEST.—EXTERNAL PRESSURE.—ENDOCARDIAL MURMURS SOMETIMES CONFOUNDED WITH THE MURMUR OF RESPIRATION.—A PECULIAR MURMUR, AKIN TO THE ENDOCARDIAL, A FREQUENT CONCOMITANT OF PULMONARY CONSUMPTION.—ENDOCARDIAL, ARTERIAL, AND VENOUS MURMURS, PROCEEDING FROM IMPOVERISHED BLOOD.—EXOCARDIAL MURMURS.—THEIR SEAT THE PERICARDIUM.—THEIR ONLY KNOWN CAUSE THE FRICTION OF ITS SURFACES IN A STATE OF DISEASE.

If ever a single sign could be taken at all times to denote one thing and one thing only, you might think perhaps it must be the endocardial murmur to denote mechanical impediment from valvular disease. The theory of its production by this cause is very plain and intelligible; and many a man's experience may have run uniformly in confirmation of it in every instance, without exception, which has fallen under his notice. But still individual experience, be it ever so large, is not all experience; and truths without exception are not the truths most commonly met with in medicine.

There are cases of endocardial murmur in which valvular disease is at least doubtful; and cases of endocardial murmur in which there is mechanical impediment but no valvular disease; and cases in which there is neither mechanical impediment nor valvular disease; and there are cases, too, in which the ear itself is apt to be deceived into the belief of a murmur proceeding from the heart, when there is no such murmur in fact.

Now it is unwise so to treat of any medical subject as if it were complete. Yet nothing, it must be allowed, is more useful than to give that order and arrangement to the many

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accordant facts of medicine into which they naturally fall. But still a place must be found for other facts, few in number, which are really or apparently contradictory to the rest, or at least do not altogether harmonise with them.

Here, then, I must find a place for some of the rare facts just alluded to, which have fallen in my way, touching endocardial murmurs. I will state them, and comment briefly upon their pathological bearings and relations as I go along.

I occasionally find the endocardial murmur under circumstances unlike those usually attending it when it is the undoubted result of valvular injury, and yet it probably *does* proceed from valvular injury nevertheless.

There are cases in which the murmur is not constantly present. It comes and goes; and the circumstances under which it comes and goes are to interpret for us the nature of the disease out of which it springs.

This has sometimes occurred to my observation. The patient has been sensible of uneasiness in the region of the heart, and of occasional palpitation. Upon examination I have found the impulse slightly in excess, and the sounds louder and more diffused than natural, and nothing more. But these are the common accompaniments of nervous disorder; and accordingly I have been about to conclude the heart to be perfectly sound, and to dismiss my patient with the comfortable assurance that such was my belief. For my further satisfaction, however, I have made him walk briskly once or twice round the room, and then listening again, I have found the impulse of the heart considerably augmented, and an unquestionable murmur. A few minutes of quiet have moderated the impulse, and stilled the murmur: but he has taken another turn round the room, and both impulse and murmur have returned. And thus has the murmur been audible on exertion, and inaudible on repose, several times in a quarter of an hour.

Now here, where we can make the murmur come and go at will, simply by augmenting and reducing the force of the heart's action, it is reasonable to believe, that there may be a mechanical obstacle at an orifice of the heart, but that it is of small amount; not enough to cause the requisite degree of vibration when the current of the blood is slow and undisturbed, but quite enough when it is more rapid and forcible.

This view of the matter obtains some illustration from what has fallen under my observation in certain cases of rheumatic endocarditis, where a perfect cure has ultimately taken place. Here, before the endocardial murmur has ceased altogether, there has often been a period during which it has been sometimes absent and sometimes present—absent during repose, present on exertion. You will hardly yet be able to see the force of this argument, in which I am anticipating a part of our subject to which no allusion has hitherto been made; but you will see it and appreciate it hereafter.

Three or four cases have fallen under my notice where an endocardial murmur has arisen for the first time a few days before the patient's death. I have been quite sure that it has not existed previously, and I have had no prior suspicion of disease of the heart. In these cases the act of dying was slow and lingering. And although the murmur was declared a few days before death, it did not arise until the dissolution might be said to have already begun. But unfortunately the opportunity has not been afforded me of making inquiry into the cause of this remarkable circumstance after death. I conjectured that it might be owing to blood which had begun to coagulate within the ventricle, or even to inflammation of the endocardium, such inflammation (as we shall see) may take place at the very going out of life, and deposit lymph.

The following case was kindly communicated to me by Dr. Maclachlan of Chelsea Hospital:—"An in-pensioner, aged 61, long affected with paralysis and other symptoms indicating organic affection of the brain, became bed-ridden about a fortnight before death. He lay in a lethargic semi-comatose state, and had great difficulty both in comprehending and in answering questions. During the last week of his existence the heart's action became inordinate, and both sounds were accompanied by a *bruit de soufflet* audible only in the præcordial region. He died on the 25th of January."

"On the 21st of the month, the following is the report I made of the physical signs; and, as they interested me much, I made repeated examinations, at different hours, always with the same result, the sounds varying in degree with unknown circumstances.

"Percussion unusually clear in the præcordial region;

heart's action inordinate, but regular; impulse seen as well as heard. Both sounds are accompanied with a *bruit de soufflet*, more intense with the first. There is a most peculiar, short, clear, abrupt barking sound occasionally heard, which has its greatest intensity immediately behind the nipple, and extends only a little way on either side of it. This sound bears a remarkable resemblance to the yelping of a very young puppy dog. It appears to commence with the first sound; to be for an instant, and then to cease immediately. When it is loudest, it is easily heard with the ear a little removed from the end of the stethoscope. There is no fremitus, and the bruits are not audible in the larger arteries, or beyond the præcordial region. The man appears to suffer no pain; and pressure underneath the ribs, in the direction of the heart, neither affects the breathing nor produces uneasiness. The pulse is small, soft, and regular.

"Scarcely any change took place in these signs up to the termination of the case, with this exception, that, as the heart's action became more feeble, the peculiar yelping sound diminished in intensity and frequency.

"On examination, forty-eight hours after death, I found nothing to account satisfactorily for the production of the sound alluded to. The pericardium was, however, unusually thin and dry, and contained much less than the usual quantity of fluid, for it scarcely amounted to half a drachm. It was not rough, nor did it present any evidence of inflammation. The heart felt firm, was preternaturally small, and the left ventricle presented a beautiful specimen of concentric hypertrophy, the walls exceeding an inch in thickness, and the cavity scarcely admitting an ordinary-sized nutmeg. The right ventricle was in all respects natural, and the valves of all the cavities, as well as of the arterial trunks, were sound."

Here, with the appearances after death to help me, I can come to no reasonable explanation, how the endocardial murmur was produced during life. The case is very striking in all its circumstances, and well worth recording; and the best place I could find for it is this, where I am speaking of the endocardial murmur, never heard before, being first noticed among the symptoms of dissolution.

Can the heart, by the mere force of its contraction, produce a murmur exactly resembling that which proceeds from valvular impediment? Perhaps it can. A young woman, herself in perfect health, nursed an infant, to whom she was greatly attached, in an attack of hydrocephalus. The infant died, and she was seized with violent hysterical emotion. I did not see her until the nervous struggle had come to an end, and she was lying in bed apparently free from present excitement. But the heart was still contracting with excessive force, and with the loudest possible bellows-murmur. The next day the heart was beating quietly, and the murmur was gone.

It is (I believe) a rare thing in adults, but in children common enough, for an endocardial murmur, simulating valvular disease, thus to arise from the mere force of the heart's contraction.

Again, I have found the endocardial murmur under circumstances in which it was assuredly owing to mechanical impediment encountered by the blood in its passage through the heart, and where the nature of the impediment was obvious enough; but it was not valvular injury.

Strange things happen to the heart when the chest is deformed. There is an end of our pretending now to calculate what its condition may be by listening and feeling and percussing. Its sounds and impulses and resonances, be they what they may, are now worth nothing at all as guides to diagnosis. The heart is dragged from its proper seat, and imprisoned in some strange place, and perhaps turned almost topsy-turvy by the encroachment of the vertebral column and the approximation of the ribs. And thus cramped in and hooped about with bone, at every movement it gives a jar that may be felt, and a sound that may be heard in every part of the chest. And this sound, which is thus conveyed to a distance, is seldom the natural sound; but a loud whiz, the same in kind and the loudest in degree, which belongs to mechanical impediment from valvular disease. And mechanical impediment there is, but valvular disease there is none. The weight and pressure, which the heart or its large vessels sustain from the hard framework of the chest, raise the impediment, and throw it in the way of the circulating blood.

Here the cause from which the endocardial murmur proceeds is without the heart, but *within* the body. It may be both without the heart, and without the body.

A little boy, aged eight years and a half, high-spirited and vivacious, but thin and out of health, was brought to me under a suspicion of disease of the heart. Its impulse was not felt beyond the apex, but *there* it was in excess; yet there was no larger space of dulness than natural in the præcordial region. Upon auscultation, however, this remarkable peculiarity was made out. When the ear or the stethoscope rested gently upon the præcordial region, no unnatural sound whatever was heard. But when either the ear or the stethoscope was applied with such force as to cause the ribs to sink a little below their natural level, then a loud bellows-murmur sprang up. The space at which it was heard, and not beyond it, was just so far as the mouth of the stethoscope covered, when it was placed upon the cartilage of the third rib as a centre. Below and above this spot the murmur vanished, and it was audible neither in the course of the aorta nor in the carotids.

This case, which occurred to me five years ago, has made me watchful ever since, lest haply I might sometimes create the murmur I was in search of. And it is no needless caution where the patient is young and the frame-work of the chest is yielding. Never, indeed, the chest being not deformed, never but in this single instance, have I produced a murmur simulating that of valvular disease. But very often, when, over-earnest in what I was about, I have pressed too heavily upon the præcordial region, a sort of jarring sound has reached my ear, and brought with it the suspicion of disease, until setting the heart free from the weight and the restraint which I had inadvertently imposed upon it, I have at once lost the sound and the apprehensions too, which had arisen from my own awkward manœuvring.

It is well to know this possible fallacy of our own making, and so to guard against it.

But, though by pressure upon the præcordial region, I have often produced some unusual sort of endocardial murmur, never (as before stated), where the chest has been free from deformity, have I produced the murmur exactly simulative of that which belongs to valvular disease but in this one instance.

The chicken-breast, which scarcely passes for a deformity, is often sufficient greatly to alter the relation of the heart to the walls of the chest. It often thrusts it forward, and brings its whole anterior surface in contact with the sternum and ribs Hence in such cases the question, whether the heart be sound or unsound, becomes puzzling enough. Sound or unsound, its impulse is to be felt and seen in all the space at which it lies in contact with the chest, and the same space is dull to percussion. Extensive præcordial impulse and extensive præcordial dulness are the very signs of hypertrophy; and if to these be superadded the endocardial murmur, you have the complete signs denoting the commonest form of complex unsoundness which the heart is apt to undergo, viz. hypertrophy with valvular disease. But beware, now especially, beware, of creating the endocardial murmur by the application of the ear or the stethoscope to the præcordial region. Nothing is easier. I have done so frequently in such cases by way of experiment.

There is yet another possible fallacy imputing an endocardial murmur, and with it the suspicion of disease to the heart, where no such murmur and no such disease really exist. Here, however, the fallacy is not of our own making, but arises altogether from a perplexing coincidence of action between the heart and the lungs.

It has been said that endocardial murmurs are best imitated by modulations of the breathing and by help of the mouth. Hence it is not to be wondered at that there should be an endocardial murmur which nearly resembles the natural murmur of respiration. The commonest of all the endocardial varieties is the bellows-murmur; and the natural murmur of respiration is only a gentler sound of the same kind, but more prolonged. Hence the morbid sound of the heart and the natural sound of the lungs are sometimes so much alike, that, if the systole of the ventricles and the act of inspiration kept time with each other, it might not be easy to determine from which of the two organs the murmur came.

And, in point of fact, I have sometimes listened and hesitated, and hesitated and listened again and again, before I could satisfy myself that a murmur which came altogether from the lungs did not in part proceed from the heart also. It has been carried with an impulse into the ear as if it came from the heart. The method of clearing up the doubt is to auscult the heart, while the respiration is suspended for a quarter of a minute.

I must here find a place for noting a certain auscultatory phenomenon, which, though it may not have struck the general observation, is frequent and familiar to my own, and has gained an importance in my eyes from the pathological conditions with which I have found it associated. To the ear it claims kindred with endocardial murmurs. But although the heart may be instrumental in producing it, it is not at all perceived within the præcordial region, but in a certain definite and circumscribed space beyond it.

Fancy a line drawn from the left side of the sternum along the upper edge of the second costal cartilage and continued an inch along the second rib; and another line drawn from the sternum along the lower edge of the third costal cartilage and continued an inch along the third rib. Between these two lines a space is included, in the whole or in part of which a murmur is often audible coincident with the systole of the heart, when no such murmur can be perceived either in the præcordial region, or in the course of the aorta, or in the carotids, or in any part of the arterial system, but here and here only. It is a gentle bellows-murmur, quite obvious to the ear and unmistakeable in its character.

Of such a murmur, often audible in this situation exclusively, I am certain as a matter of fact, and certain too of its very remarkable accompaniments. I have witnessed it either in those who were undeniably consumptive, or in those who were too justly suspected of being so. I cannot say in what proportion of the phthisical it occurs: but I am continually meeting with it.

Yet my knowledge goes no farther than the living symptom. I have gained no explanation of it by dissection: I have only a clinical experience of the matter. But there is a practical usefulness in the mere experience of coincident facts, though their pathological relation be not yet understood. Thus, where from my direct examination of the lungs I cannot get beyond a suspicion of tubercular disease, the murmur in the space indicated must always contribute to confirm it.

Supposing the pulmonary artery in its first divisions to be the seat of the murmur, does it become such in consequence of its own disease or by reason of pressure or impediment reaching it from diseased lung?

Thus far we have dwelt upon endocardial murmurs, as the result of mechanical impediment to the circulation, real or suspected; real, when it proceeds from known valvular disease; suspected, when it proceeds from other causes which are less surely ascertained. Moreover, we have noticed, by the way, the possible fallacy in some cases of mistaking the respiratory murmur of health for the endocardial murmur of disease. And we have alluded to a murmur accompanying the systole of the heart, and heard in a certain thoracic space, and remarkable for its frequent coincidence with pulmonary consumption.

Certain endocardial murmurs yet remain to be noticed, which are quite distinct pathologically from all these. Synchronous with the systole of the ventricles, audible in the præcordial region, and extensively diffused through the arteries, resembling the bellows-sound, and so having the commonest quality of endocardial murmurs, not distinguishable by the ear from those which proceed from mechanical impediment to the passage of blood, yet themselves springing from a different cause, they form a class by themselves, and a most important class it is.

I allude to the cases in which there is an unnatural sound, both endocardial and arterial, and yet no change of structure in the heart and arteries, but a change in the relative proportions of the constituent elements of the blood.

The one general fact with which the sound is constantly associated is an impoverishment of the blood, or the state in which its red globules are deficient and its serum is in excess.

Now this impoverishment of the blood would seem to stand to the endocardial murmur in the relation of a cause from observation of their constant coincidence merely; and much more so, from the observation that, upon removal of the first, the second always ceases. In proportion as under proper medical treatment the blood becomes richer, and is made to abound more in red globules, the murmur waxes fainter and fainter in the heart and arteries, until it is finally altogether inaudible in both.

But if this endocardial and arterial murmur be really owing to an impoverished state of the blood, one would expect to find that the simple abstraction of blood to a large amount would produce it at any time in a healthy person. And so it will. We are not indeed accustomed thus to bleed healthy persons purely for the sake of experiment. But healthy persons sometimes become the subjects of such treatment in the case of accidents and injuries, and in the first access of acute inflammation; and then we take advantage of the occasion for learning the effect of the experiment beyond the purpose for which it was instituted. And so we find that, if in a healthy man we carry bleeding far enough to blanch the surface of the body, we create an audible systolic murmur in the præcordial region, and diffuse it through the arteries.

Now this murmur is prominently characteristic of certain forms of disease: and, knowing how we can produce it at will, we should expect to find nature producing it exactly or nearly in the same way. Profuse or protracted menorrhagia, by the time it has blanched the skin, has this murmur for its sure accompaniment. Here is direct loss of blood. Chlorotic anæmia has the same. Here is no direct loss of blood, but, what is tantamount to it, a defect or failure of the assimilatory functions, whence the mass of blood is not replenished in due proportion to its expenditure upon the uses of the economy.

Generally accompanying the endocardial and arterial murmur, when it is owing to anæmia or an impoverished blood, there is another sound quite different in kind, and formed neither in the heart nor in the arteries, but traceable to the same pathological condition.

In following the murmur from the heart along the aorta and the subclavian artery, and then above the clavicle, when you reach the carotid you find a new sound superadded to it. You perceive the bellows-murmur coming and going with distinct whiffs, and keeping time with the systole of the heart in the neck as in the chest; but in the neck you perceive, moreover, *a continuous hum*, like that which reaches the ear from the hollow of a marine shell. This is a thing so evident, that it was noticed and described, and variously speculated upon by those, who first practised auscultation. But their speculations were wide of the mark. Whence or how it arose no one could tell, until the sagacity of Dr. Ogier Ward traced it to the veins, and showed it to proceed from the movement of the blood within them.*

The vein, which offers itself most readily to the application of the stethoscope, and admits all the easy experiments which serve to certify the fact, is the internal jugular. Place the instrument upon the neck by the side of the trachea, and pretty close to it, and at the same time rest your finger upon the space between the angle of the jaw and the mastoid process; and when your ear has caught a continuous humming sound, and listened for a while and made sure of it, then press your finger firmly down upon the vein, and the sound, if it be the true venous murmur, will immediately cease; then raise your finger, and if it be the true venous murmur, it will immediately return.

A little management and address are needed to find this venous murmur, and then keep it within hearing when you have found it. I have seen it found by accident, heard for a minute, and then lost and never heard again. The instrument has been laid carelessly upon the neck and the murmur has been audible immediately; and then, in expectation of making it heard to more advantage, the neck has been put upon the stretch, the chin raised and the head thrown back, or turned far round to the opposite side, whereupon the murmur has ceased. Then the neck has been relaxed, the head brought forward, and the chin inclined towards the sternum, but the murmur has not returned. The truth is, a very free current of blood is essential to the production of the venous murmur. A slight degree of pressure upon the vein will alter its character, and pressure very far short of that which would arrest the current of blood will abolish it altogether. And thus the neck being put upon the stretch, the muscles, which lie parallel with the vein and across it, are made to exercise pressure enough upon it to interfere with the free current of blood, and to stop the sound: or the neck being relaxed, the vein and the integuments get folded together, and so pressure is produced in another way, and this equally stops the sound. Try different degrees of pressure upon the internal jugular vein with the stethoscope when the venous murmur is distinctly audible, and you will find how lightly you must hold the instrument to keep it constantly within hearing, how inconsiderable an amount of pressure will obliterate it, and how each degree short of that which obliterates it will give it sundry varieties, and make it musical.

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* Med. Gazette, vol. xx. p. 7.

Now these murmurs, whether appertaining to the heart and arteries or to the veins, which have their origin in the quality of the blood that circulates within them, furnish an eminent example of the highest degree of comprehensiveness both for knowledge and for use, which can belong to the idea of a symptom.

Where these murmurs are, there a countless variety of other symptoms is found in company with them, pointing to all organs of the body, and giving notice that the functions of all are going wrong; the surface pale and cold, palpitation and dyspnœa, appetite perverse, digestion imperfect, nutrition insufficient, secretions scanty and unhealthy, pain everywhere, and a shattered nervous system and an enfeebled brain. Such a portentous crowd of symptoms strikes the observation at once. But what they all mean, we cannot tell, until we take one single symptom for their sole and sufficient interpreter. The murmur which is at the same time endocardial and arterial and venous is comprehensive of them all, and includes the knowledge of them all, inasmuch as it points directly to their one common source, even the impoverished blood. And further, this same murmur not only contains the knowledge of all the rest, but it is the single representative of them all as an indication of treatment. Standing, as it does, for the sign of impoverished blood, we treat what it denotes, and nothing else. But in so doing we treat inclusively every error of function throughout the body which proceeds from it.

Such are endocardial murmurs, which have their origin and seat and efficient causes within the heart, which are different in kind from its natural and healthy sounds, and which take the place of them. Their causes (as far as our present knowledge has reached) may consist in unusual vibrations induced among the particles of the blood either by mechanical obstacles which it encounters in its passage, or (whether directly or indirectly) by a change in its constituent elements, and quite independent of such obstacles.

But there are also exocardial murmurs, of which the general characteristics have been already given. These have their origin and seat and efficient causes *without* the heart; and, while they are different in kind from its natural and healthy sounds, they do not supersede them, or take their place, or necessarily interfere with them in any way. They are formed in the pericardium.

The lungs and the pleura, and the heart and the pericardium, have many things which bear a resemblance or analogy, so far as regards the murmurs resulting from them respectively in their several diseases; these may be now usefully adverted to in illustration of that part of our subject at which we have arrived.

Such is the structure of the lungs that they perform their natural and healthy functions with certain perceptible sounds. But such is the structure of the pleura that no perceptible sound whatever attends its natural and healthy functions. The pleural surfaces glide over each other in perfect silence, and the ear can catch not the least notice of their contact and movement in opposite directions. Hence this difference belongs to the auscultatory signs arising from diseases of the lungs and of the pleura respectively; that in pulmonary diseases the auscultatory signs consist of the *natural* sounds exaggerated or diminished, or occasionally modified, as well as of *new* sounds, whereas in pleural diseases, there being no natural sounds to be exaggerated, diminished, or modified, the auscultatory signs consist of new sounds alone.

The same may be said of the heart and the pericardium. Take the heart apart from the pericardium, and it never moves without a sound. Take the pericardium apart from the heart, and it never moves with one. Take the diseases of the heart apart from those of the pericardium, and the auscultatory sounds denoting them may consist of its natural sounds exaggerated, diminished, or variously modified, or of sounds altogether new in kind. Take the diseases of the pericardium apart from those of the heart, and the auscultatory signs denoting them (since the pericardium has no natural sounds capable of being exaggerated, diminished, or modified) must always consist of sounds new in kind, and of such only.

Farther, the lungs and the heart have not only the elements of their diseased murmurs contained in their natural sounds, but it is by the same instrumental means that they bring out both; and these are the very instrumental means of their own vital functions. It is the air by which, and out of which, the lungs effect their office of respiration; and it is the air by which they form the sounds which are the audible notices both of their health and their disease. It is the blood by which, and for the sake of which, the heart fulfils its office of circulation, and it is the blood by which it makes its sounds of health and its murmurs of disease.

But it is otherwise with the pleura and the pericardium. As there is no element of the to and fro sound discoverable in health, so there are no instrumental means then in operation out of which it could be formed. The pleura does not make its attrition-sound by the respired air, or the pericardium its attrition-sound by the circulating blood. But the instrumental means of both are purely the creation of their diseases. These consist of strange substances separated from the blood and deposited upon the pleural surfaces, or the pericardial surfaces, spoiling their natural smoothness and lubricity, interrupting their noiseless play upon each other, and causing them to grate together with a sound.

LECTURE IV.

GENERAL ESTIMATE OF THE USES OF AUSCULTATION APPLIED TO THE HEART.

WHAT I have laid before you is the alphabet, or at most the spelling-book, without which you will never be able to understand the auscultatory language expressive of diseases of the heart. And, until you know it, and know it well, you must go on blundering and guessing as children do, until they have learnt to read.

But to decipher the auscultatory language of diseases of the heart easily and accurately is an affair requiring labour and use and docility. If you find it a hard task, you most not excuse yourselves upon the plea that this, that, and the other man knew nothing about it, and yet they were esteemed wise in their time; or that many men, who now pass for wise, deride it, or that many, who profess to understand it, make mistakes about it or apply it to no good end.

Yet as the ability to read does not make a man literary or learned, but only furnishes him the means, the indispensable means, however, of becoming so, so neither does the skill to decipher the auscultatory language of the heart make him all at once a great pathologist or a good practitioner in respect of its diseases; but being constantly, soberly, and diligently applied, it furnishes him with much help towards a surer knowledge and a better treatment of them. For auscultation is conversant with principles.

And above all things we should covet principles; for most certainly they do not abound in practical medicine. The records of practical medicine are chiefly made up of the sagacity of this man and the experience of that, of much that has been luckily conceived or cleverly reasoned, and of some things that have been concluded with a fair probability of truth. But in all this sagacity and experience, in all that has been so conceived and reasoned and concluded, there is wanting the test of principles to tell us how much real truth is contained.

Now, as the best men among us have ever felt the want of principles to test the truth both of their own knowledge and that of others, so they have been ever ready to accept them whenever they have appeared. Whenever in medicine any thing like a discovery has been made, any thing which has had the show of a principle or a law, a large surrender of cherished opinions has always followed, and knowledge has seemed to begin its career afresh from a new starting place. Mr. Hunter's work on the blood and inflammation abolished half the knowledge which the world had then to boast on these subjects. It showed that there had never before been any such thing as a pathology of local morbid processes. Abounding in principles, or in the germs of principles, it afforded a point of departure for all future study and observation, to the disregard of abundance of notions, opinions, and reasonings previously accepted and allowed.

So in our own times auscultation has been a discovery in the art of clinical observation, inasmuch as within a certain sphere it has furnished us with principles really scientific for its use and exercise; consequently in regard to the diseases of those organs to which auscultation is applicable, almost all the previous records of clinical medicine have become useless. Our inquiries now begin, and begin with certainty, from a new starting point; a point which, formerly, if they ever reached, they only reached by conjecture.

For how then stood our knowledge of diseases of the heart before auscultation came to illustrate them? Truly by the profession at large they were not much thought of or inquired about until the commencement of the present century. Yet Senac's was a great work, and the Epistles of Morgagni abound in scattered information of great value upon this subject. A good deal was known, but the knowledge was hidden knowledge. It had not reached the general mind. Indeed the heart, in respect of its pathology, seemed to lie out of the high road of popular interest, until Corvisart wrote.

The treatise of Corvisart, when I was a student, was in all our hands. And it well deserved to be: for in it there was knowledge of the best kind displayed in the best manner. Taking what information he thought valuable from the works of others, and blending it with his own special experience, he brought the whole to bear upon the pathology and clinical diagnosis of diseases of the heart. Thus the entire subject may be said to have been first brought out of obscurity, and first placed fairly within our reach, by the clear and vigorous and methodical and popular manner in which it was handled by the genius of Corvisart. I do not believe it possible that the diagnosis of diseases of the heart could ever have been carried beyond the point to which Corvisart brought it (yet how far was it from certain?) by anything less than some new discovery in the art of clinical observation.

That discovery has been made which we possess in auscultation. Thus many forms of structural disorganisation and disease belonging to the heart, which after much time and much calculation of circumstances near and remote, and much cautious reasoning, could heretofore be only plausibly and probably conjectured during the life of the patient, are now known at once and infallibly attested by the ear. But the ear must be a well-educated and well-practised ear, or it is not a trustworthy witness. Remember this: for the knowledge of the senses is the best knowledge; but delusions of the senses are the worst delusions. And men are as often deceived by their ears as by their eyes; and they may *hear* ghosts as well as see them.

But it is needless to dwell upon the indisputable fact, that by the use of a well-disciplined and well-practised ear we arrive at a readier and surer diagnosis of diseases of the heart than by all the other means of inquiry which clinical observation can command. Still we should be careful to form a right estimate of auscultation; to value it for what it is worth and not for what it is not. There is much indifferent taste and worse judgment in the world, which are apt to applaud in the wrong place, and so to injure many things really good by their undiscerning patronage of them. Auscultation has suffered in this way from its friends; and therefore I think it worth while to try and set it right with the world, not concealing its weak points while I endeavour to do justice to its strong ones. I am speaking of auscultation only respective to the heart.

The age we live in cannot be better characterised, as to 'the manner in which medicine has been studied and pursued in it, than as the age of morbid anatomy. Almost the only instrument of pathological research has been the scalpel. Now, that great good has resulted from morbid anatomy it would be unjust to deny. But this good there is a tendency to exaggerate; and, such as it really is, it has certainly fallen short of what might have been anticipated from the universal study of almost half a century. At length it has now confessedly done its best; and all great improvements in medicine pathologically or practically must henceforth be looked for not from morbid anatomy but from other sources.

So far as morbid anatomy contemplates the late or last results of disease which are fixed and irremediable and unalterable, its value is very small. But so far as morbid anatomy contemplates *disease in progress*, and scrutinises and explains its organic processes, its value is very great.

Now the objects of morbid anatomy are the same with which auscultation is peculiarly conversant in the organs to which it reaches. And auscultation must have its value estimated in proportion to these objects, be it less or be it more. When during life it announces, even with infallible certainty, the late or latest results of disease, now become fixed, irremediable, and unalterable, auscultation is at its lowest estimation. When during life it declares with equal certainty the existence of disease while it is yet active, progressive, and remediable, auscultation is at its highest value.

Of the diseases of the heart which affect its structure and are equally the objects of morbid anatomy and of auscultation, the great majority are tardy and secret in their growth, and by the time they are so far developed as to disclose themselves to our clinical research they have already passed beyond the reach of our remedies. They are no sooner known to exist than they are known to be incurable. Already they bear the character of results, not of operations. Atrophy and hypertrophy of its muscular substance, and dilatation of its cavities, cartilaginous thickening and ossification of its valves—these are the forms of disease or disorganisation of the heart which crowd upon us in hospitals, and are submitted to us in private, to say what they are, and how to cure them.

And indeed by help of auscultation we *can* say what they are, but cure them we cannot. While they reveal themselves almost infallibly to the ear, they are absolutely beyond the reach of any restorative power which either belongs to the body spontaneously, or is capable of being called into exercise by art. Their clinical diagnosis is indeed wonderfully complete and beautiful; and the ability of forming it which proceeds from a well instructed ear, would, upon each occasion of its success deserve to claim a sort of triumph, if success were not very common.

For a long time, after most physicians of common sense had accepted auscultation, and allowed its use, and most physicians of moderate experience had gained some familiarity with its practice, its application to the heart was only known in cases of its fixed, unalterable, and irremediable disorganisations; and of these it certified the existence, and this was all. But there is nothing so captivating as NEW knowledge. Even though its subject be incurable diseases, which it renders not a whit the less incurable, still it is captivating. Hence the extraordinary interest with which auscultation invested these incurable diseases of the heart, simply by making us sure of their existence.

Cases of such diseases always abounded in hospitals. They were essentially difficult cases. Their symptoms were hard to interpret into any definite meaning. They betokened that in some way or other the heart was diseased, and that in some way or other their sure termination was death. Day by day to watch over these cases and to treat them was an irksome duty —it was even a thing to damp the spirits.

But auscultation brought to them a new light and a new interest. And then these same became the cases which we were continually busy about, which we were never tired of visiting and examining and ausculting, and of examining and ausculting again and again; and so comparing our clinical observation during life with the disclosures of morbid anatomy after death we became vain of our often-verified diagnosis.

Nay, we were not only captivated with, but we almost made a plaything of, our new knowledge. Every variety of sounds arising from the heart which the ear could catch and discriminate acquired a fanciful importance; and attempts were made to signify them by apt similitudes, and even to express them by musical notes.

But no man who rightly estimates the ends of knowledge could rest in this and be satisfied; for this would be to value what he knows, not by its fruits, but by his own satisfaction in knowing it.

Thus far then in respect of the heart auscultation had taught us a surer and more exact acquaintance with many diseases which still we could not cure. The physician had become wiser, but the patient had profited little.

But there is such a thing as having knowledge in reserve; such a thing as cherishing and increasing and perfecting it in hope, and looking patiently forward that the time may come when mankind shall be the better for it.

It was in this spirit that the more sober-minded of medical men at first, and for a long time, continued to exercise auscultation in its application to the heart. Full of interest about it, they were ever improving their skill in it, and ever learning from it all that it was yet able to teach. But they held their new knowledge not as a boast, but as an encouragement, believing that there was a sealed-up treasure of usefulness within it, which they should one day penetrate and disclose.

Yet time went on: and still auscultation only told us of mischief when it was done, not of mischief while it was adoing. Still it found a place only for the remedy which could render what *must be* borne more tolerable, not for the remedy which could come in aid of counteraction and reparation and restoration to health. Then, looking upon the purely mechanical nature of the abnormal sounds of the heart, and at the mechanical way in which they are formed, one might be pardoned for beginning to doubt whether they would ever gain a high value among the signs of diseases whose phenomena are pre-eminently vital; of diseases, which have pain and fever and nervous irritation for their prominent ingredients: and whether they would ever help us better to understand and better to manage those diseases, which to know early is alone to know profitably, and to treat early is alone to treat successfully: whether, in short, they would ever be available for diagnosis and practice in the acute inflammations of the heart.

Again, one might be pardoned for suspecting, from their very nature, that the structural injury of the heart capable of producing auscultatory signs must be always of large amount, and the growth of long time, and that thus those signs would be found in the end to annex themselves solely to its chronic diseases.

Time still went on: and those who held the keys of knowledge in this great experiment, the physicians of hospitals, and who had the fit objects and opportunities ever at hand for proving and applying this new discovery in the art of clinical observation, were still continually aiming it, and pointing it at the same mark, viz. at the attainment of a greater practical benefit. And at length the mark has been hit, and the prize has been won. For now there is no truth experimentally more certain than this, that auscultatory signs above all others, and oftentimes before all others, and oftentimes in the place of all others, may be safely trusted to declare the beginning and the augment, the decline and the cessation of acute inflammation in those structures of the heart, which are especially, if not solely, obnoxious to it; and that the same signs may be confidently appealed to as guides, by which to choose the remedy, and apportion its quantity and regulate its force, and continue or discontinue its application.

A great amount of structural mischief (it appears) is not needed to produce in the heart an unwonted sound. As with the more delicate pieces of machinery the least injury will produce a jar, so with the heart; and as with them this jar is often the *first* notice of something wrong, so with the heart; and as in them the ear will often at once detect whether the fault be of a wheel, of a screw, or a spring, so in the heart it will at once tell whether the disease be of the membrane which invests it without, or the membrane which lines it within.

Let it then be borne in mind, that the diseases and disorganisations of the heart, which auscultation reveals to us during the life of the patient, are of two classes. The one includes those which are perceptibly progressive from day to day, and in which we contemplate a present moving energy and operation. The other includes those which are stationary, and in which we contemplate a fixed and permanent result.

Now it is upon the first class of affections of the heart that I shall principally dwell; because they are those of which there is a less familiar knowledge in the world, and therefore more need of information, and because from the newness of their matter they have a greater interest; but above all, because they are really and practically the most important. For the danger to life with which they are charged is great, and great, too, is the danger of permanent injury to the organ if life be saved;

so that all the extreme vigilance of time and opportunity which we can bestow, and many of the most powerful remedies which medicine can furnish, are needed to save life and to save the organ. Besides, these are the affections of the heart which more than others seem to belong to it as its own by a strict and peculiar, though not quite exclusive, appropriation. For in them, except where it is occasionally shared by the lungs, the whole force of morbid action is expended upon the heart. In them, except where the mischief occasionally reaches the lungs also, life is perilled or destroyed by the magnitude of the injury done to the heart; and in them, except where some part of it is occasionally called for by the lungs, the entire strength of the remedy is brought to bear directly upon the heart; well therefore may they demand the most careful inquiry which we can give them.

Upon the second class of affections of the heart, those which are secret and chronic in their growth and unalterable and irremediable in their nature, I shall content myself with a more general commentary. Indeed, for the sake of practical utility, this part of the subject needs rather to be compressed than enlarged. It is difficult to say what is its natural limit: it runs out into so many subjects beyond itself, that if they were all pursued they would lead us a ramble over the whole field of pathology and practice.

After auscultation has taught all that can be learnt concerning these affections as inherent in the heart, their exact seat, and the exact nature of the mechanical change of structure in which they consist, there is an end of all our concern with them as such. No treatment follows. The injury done cannot be undone. We have most probably made a correct diagnosis. It is a poor boast indeed; but it would be hard to grudge us the little satisfaction (it is all we claim) of having done so.

Whatever objects of further interest belong in any way to these cases, whatever objects of medical treatment there are in any way connected with them, must be sought and found out of the heart itself and beyond it. But in most of these cases it is not what we hear with our ears, it is not the injury suffered by the heart that directly kills. Doubtless, if we could remove it, the patient would be well; but though we cannot remove it, much more must be added to it before he dies. For out of it is apt to spring every kind of disease which can be formed by blood and blood-vessels in all parts of the body; congestions and effusions, hemorrhages and inflammations, cerebral or pulmonary, renal or hepatic. These constitute diseases of various character and various name, according to the organ or the function which they damage or destroy. Now it is of some of these that the man whose heart-disease is of chronic growth commonly dies; and these are the objects of medical treatment —objects for anticipation, for postponement, for mitigation, and for temporary cure.

Concerning auscultation, then, in its application to the heart, our inquiry hitherto has embraced the nature of its signs and symbols, and what they are in themselves, and how they are formed, and what they directly indicate; also the certainty of their use in the discovery of diseases of this organ during life, and the extent to which clinical observation has profited by them, and wherein, according to our present knowledge, consists their greatest practical value, and wherein their least.

We will now proceed to pursue the subject in its practical details, when much of what I have stated generally will be more clearly seen and acknowledged; this indeed, and much besides, which cannot in this place be intelligibly explained, viz. that auscultation has actually disclosed to our knowledge by far the most important portion of the entire pathology of the heart. Before I enter into these details, I wish to say a few words, by way of excusing myself to those who may find fault with me for many omissions, and altogether far too much conciseness in handling so large a subject as diseases of the heart.

There are subjects in medicine about which the information of various kinds to be found in books is enormous; and if you would learn all about them that is known or surmised, all that is settled or is yet in controversy, you must go through abundance of reading, and have abundance of leisure, that so by thought and meditation you may make all that you read your own.

But many of these subjects are practical subjects. Yet, extensive and difficult as they are, there are men whom duty and conscience require to have such a knowledge of them as they can use readily and profitably every day of their lives; and such a knowledge, doubtless, many *do* possess; and surely, you may fancy, this must be a *perfect* knowledge; but perfect, as including every thing that belongs to the subject, it certainly is not, perfect in its uses it may be.

The truth is, the knowledge which rules and regulates practice, and which best insures its success, is commonly a *selected* knowledge. It is also a knowledge which is compressed and compendious in its form and compass, and so always manageable and always ready for using, and made to him who holds it surer and surer by daily trial and experiment.

Now upon the subject of the heart and its diseases, what knowledge I have to impart to you must be a *selected* knowledge; for passing by what to me, at least, is less certain and less stable, I shall be content to dwell upon what from experience is best understood by myself, and is likely to be most useful to you. Here is a great hospital; and here I hold that all teaching by lectures should have for its first and principal purpose to give effect to that self-teaching, which, from the objects which surround us, all may practise and profit by who have eyes and ears and a docile mind. Do not believe a word that I say until you have gone into the wards and proved it. There you will find your great book of instruction. I only pretend to supply a key, a glossary, or an index to it. Use that book as you ought, and then, though in the end you and I may have the same knowledge, it will not be because it has passed from my mind to yours, but, being gained by your own observation, ratified by your own proofs, and matured by your own thought, you will have it and hold it as your own independent possession.

LECTURE V.

INFLAMMATION OF THE HEART.—ENDOCARDITIS AND PERICARDITIS.—THE ENDOCARDIAL AND EXOCARDIAL MURMURS THEIR CHIEF DIAGNOSTIC SIGNS.—HOW THEY BECOME SUCH.—THE ENDOCARDIAL MURMUR, THOUGH FOUND IN NUMEROUS OTHER DISEASES OF THE HEART, YET CONDITIONALLY THE SURE SIGN OF ENDOCARDITIS.—THE CLINICAL KNOWLEDGE OF ENDOCARDITIS A NEW KNOWLEDGE.—ITS CONNECTION WITH ACUTE RHEUMATISM.—HOW IT CAME TO BE DISTINGUISHED, DURING LIFE, FROM PERICARDITIS.

WE proceed next to consider the diseases of the heart *clinically;* and, first, its inflammations. These, as far as we know, have their local origin and seat almost exclusively in the endocardial and pericardial membranes.

Now the entire clinical history of endocarditis, or pericarditis, viewed in all its details, is a very large and a very intricate subject; too large and too intricate to be made intelligible, unless it can be greatly abridged and simplified. But how to abridge and simplify it, and yet do neither wrong nor prejudice to any substantial truth, is a difficult matter.

For this purpose I shall set up one pre-eminent sign for each disease, and direct my course by it. And thus the clinical history which I shall give of each will be little more than a commentary upon its one pre-eminent sign, and the time and conditions of its appearing, continuing, and ceasing; while I shall regard other signs, many or few, constant or occasional, coming or going, as subordinate to it.

The pre-eminent sign of endocarditis is the endocardial murmur, and of pericarditis the exocardial. But a clear notion must be had how they become such before we advance a step further.

The abnormal sounds or murmurs of the heart in their primary signification are, for the most part, the immediate result of causes merely mechanical, the jarring and creaking and grating of a piece of machinery that is out of order; and in learning whence and how they are produced, we learn at the same time *what part* of the machinery it is that has suffered injury.

But it is a vital piece of machinery this with which we have to do; and the injury that makes it jar and creak and grate is the *product* of vital processes, of an unhealthy kind, which are, or have been, at work within it. Thus, in learning the mechanism of the heart's abnormal sounds we learn something of its diseases—we learn their seat.

This is the first piece of knowledge that comes to us from the study of the heart's abnormal sounds, the diagnosis of the heart's diseases in respect of *their seat;* and from the study of them and them alone this diagnosis may reach an extraordinary accuracy. Yet still it is a diagnosis only of *their seat;* and to rate it at any high value would be ridiculous, if it led to nothing beyond itself.

But besides the seat of its disease, there is their nature, their origin, their progress, their events, their treatment to be inquired into. These are great heights of knowledge, and we must in some way contrive to reach them. Yet how can the theory of its abnormal sounds, when best understood, possibly help us? At first sight it appears as the lowest round of a ladder, the step just off the ground, upon which, when a man has duly secured his footing, he seems at a disheartening distance from the top.

Well, then, how comes the endocardial murmur to be the pre-eminent sign of endocarditis, and the exocardial of pericarditis, for neither one nor the other has any thing to do with inflammation *in its essence*, or with the vital inflammatory process as such? They have only to do *with the products* of inflammation and the peculiar mechanical effects resulting from them in the situations where they are now found. Thus they become diagnostic of inflammation, not absolutely, but concurrently with other signs and with certain present states and conditions of the constitution at large.

The endocardium becomes rough and rugged from various causes, and from inflammation among the rest; and the pericardium becomes rough and rugged from inflammation, and scarcely (as far as I know) from any cause beside. But, from whatever cause they become such, the endocardial murmur will have the same character in one case, and the exocardial the same character in the other. For in both cases the murmurs *alone* testify to the rough and rugged surface, and nothing more. But then the whole constitution is in a state of fever, and when the present disease, which it suffers, is such as has endocarditis or pericarditis for its frequent accompaniment, then should either of the murmurs, not heard before, all at once arise, it would proclaim inflammation of that membrane, to which it pointed, without a doubt.

Thus, though the murmur *alone* would not mean endocarditis or pericarditis, yet all other symptoms put together would not be enough to make us sure of either one or the other *without* the murmur. But *with* the murmur a very few are sufficient to stamp the certainty of either.

Bearing these considerations in mind, we are prepared to enter upon the clinical history of these two inflammations with these two murmurs for our guide. We will take endocarditis first.

Of all auscultatory signs belonging to the heart, the endocardial murmur occurs the oftenest, and includes the most. It may result from any kind of injury sustained by the internal lining or valvular structure of the heart, which can raise an impediment to the passage of blood. It may result from any kind of force, within the body or without the body, yet exterior to the heart, which is so brought to bear upon it as to compress its cavities. Such are spinal curvatures and foreign growths within the chest; and such is any thing of weight, or bulk, or active power, applied upon the præcordial region, sufficient to cause the sternum or the ribs to yield. And it may result from the altered quality of the blood, from anæmia.

Now there are always within the hospital numerous examples of the endocardial murmur. Perhaps at this moment you might here find cases showing severally each of the specified modes in which it is capable of being produced. Such ready opportunities of comparing and contrasting things apparently the same, and so arriving more surely at the truth, may not always be within your reach. Therefore you should make the best of them while they are so.

In studying these cases you must not expect to find the endocardial murmur its own sufficient interpreter. From simply listening to the murmur, and asking no questions, you will not be able to tell what it means. In the man, who a few days ago was seized with fever, being then in perfect health, it means one thing; in the man, who has been out of health for years and has been long suffering dyspnœa and palpitation, it means another; in the man deformed from his birth, another; and in the pale chlorotic girl, with the feeble, frequent, jerking pulse, it means another. Yet it is the same kind of murmur, the murmur simulating the sound of bellows, in all; and being the same, it cannot entirely explain itself—it cannot be its own interpreter. It requires aid from concomitant circumstances to decide its meaning in each particular case. The aid it needs is often very little; but that little it must have, and then it tells its story clearly and explicitly.

Should it happen, when great heat and nervous excitement had been newly developed throughout the body, and when actual inflammation had recently become visible on external parts; should it happen that the endocardial murmur, well known never to have been present before, *then* arose for the first time; assuredly it would at once fix the seat of disease in the endocardium, and determine that disease to be recent and acute inflammation. Though there might yet be no pain, no palpitation, no direct symptom whatever referrible to the heart but the endocardial murmur alone, yet it alone would be enough to fix the seat, and, under the circumstances, the nature of the disease.

Truth in all its kinds is most difficult to win; and truth in medicine is the most difficult of all. And here is the proof of it. This acute inflammation of the endocardium, this endocarditis, has been (I will not say) altogether unknown to me, but unknown in its real extent and frequency during two-thirds of my professional life.

Morbid Anatomy had sought for it, but had sought at random, and so had only found it once or twice by chance. It had put a few cases upon record, showing that such and such were the appearances which characterised this *rare* disease, when it happened to occur. And clinical observation was equally in the dark: it had stumbled upon it now and then by accident; but when or where to look for it, or by what signs to recognise it, it could not tell.

Now clinical observation, though never blind, was, until lately, always deaf. Yet there were always many diseases which during the life of the patient spoke only to the ear. These could never have been known, or could only have been guessed at, until clinical observation learnt the use and exercise of that sense by which alone they are discerned.

Hence Auscultation has had the effect of making it appear that *rare* diseases have all at once become strangely multiplied, whereas it has only disclosed what was before hidden, and made that the subject of sure diagnosis which was before hit upon by chance.

Endocarditis is one of these apparently new diseases; and it will be interesting to trace in what manner our knowledge and sure diagnosis of it is due to Auscultation.

Endocarditis is at present chiefly known as a concomitant of Acute Rheumatism.

In the year 1826 I was the first to teach the students of this hospital the fact, that whenever the heart was affected in acute rheumatism, a sound different from the sound of health always accompanied its contraction. This was then a new fact, and one of immense importance; and all succeeding observation has gone to confirm its truth. This sound in the vast majority of instances was the bellows' murmur. I must not call it endocardial, for it was not yet known to be so. But in some, instead of the bellows' murmur, it was some strange sound difficult to describe; and in others this strange indescribable sound and the bellows' murmur seemed to occur together: there was a mixture of both.

My notion *then* was, that all these sounds arose in some way or other out of inflammation of the pericardium; and taking them all, severally and in combination, as the signs of pericarditis, I was amazed to find how far the frequency of its occurrence in acute rheumatism exceeded the common calculation and belief.

In process of time I found, upon a comparison of cases, that where in acute rheumatism the bellows' murmur occurred *alone*, the affection of the heart was upon the whole far less severe and far less perilous to life, than where some other unnatural sound occurred *alone* or in combination with it. I observed, too, that in some cases where the bellows' murmur was

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unequivocal, the patient betrayed no uneasiness, no palpitation, in short, no other symptom which could give the least suspicion of a diseased heart; yet that in the great majority of instances where it once existed it remained permanent as long as the patient continued under my care and observation.

At length I began to doubt whether the bellows' murmur arising in the course of acute rheumatism was really derived from the pericardium, and to suspect that it proceeded from the internal lining. But for years the practice of this great hospital did not afford me a single opportunity of resolving my doubt, or of confirming my conjecture. For of that disease of the heart, which, coming on during acute rheumatism, is characterised by the bellows' murmur, no patient of mine ever died, and I could learn nothing about it from dissection. But what my own experience would not furnish, M. Bouillaud's has supplied. Many have died during the active progress of this disease under his care, and dissection has found it to be inflammation of the endocardium. Thus we are indebted to M. Bouillaud for our first knowledge of this important fact.

Nearly about the same time Dr. Watson and Dr. Stokes, of Dublin, further illustrated this important subject by separating *those other* sounds of the heart, which I have mentioned to occur in acute rheumatism, from the bellows' murmur, and analysing them apart. These they found to possess the character of attrition, as if produced by surfaces moving to and fro upon each other, and traced them home to their local origin in the pericardium, and showed the condition of their production to be a defective lubricity, or a ruggedness and unevenness of that membrane, such as would result from inflammation. In short, they showed these to be the proper signs of pericarditis, as the bellows' murmur is of endocarditis; that, when in acute rheumatism either occurs alone (as it often does), the disease is simple pericarditis, or simple endocarditis; and that when in acute rheumatism both occur together (as they often do), there is a mixture of the two diseases in the same subject.

The bellows' murmur coming on in the course of acute rheumatism is a sure sign of inflammation of the endocardium. Here, then, we will drop this exceedingly vulgar name, and call it "endocardial" again. But observe, it is the general character of the morbid actions predominant in the system at large which determines the particular character of the local disease out of which the endocardial murmur arises. *They* are inflammatory, and *it* is inflammation.

In endocarditis, besides the endocardial murmur, there may be other symptoms present directly referrible to the heart, or there may not. There may or may not be pain. There may or may not be an excessive impulse, or an intermittent, irregular, or fluttering action of the heart. But the fact of endocarditis is not rendered more or less certain by their presence or absence.

There may be both pain and palpitation; yet endocarditis cannot be surely inferred to exist, unless there be the endocardial murmur withal.* There may be neither pain nor palpitation, yet endocarditis cannot be inferred not to exist, if the endocardial murmur alone be present.

Seeing, then, that the endocardial murmur alone can determine the existence of endocarditis, you are required to search after it in every case of acute rheumatism. I say emphatically *to search after it*, because it is one of those signs which must always be sought before it can be found. It does not intrude itself upon our notice like palpitation, or an irregular pulse. The patient does not draw our attention to it as he does to pain. The physician must make it out entirely for himself. And indeed it is infinitely important that he should have the earliest possible notice of it with a view to the earliest possible application of the remedy.

Never omit, therefore, to listen to the præcordial region whenever you visit a case of acute rheumatism, and visit a case of acute rheumatism oftener perhaps than you otherwise would do merely for the sake of so listening. All may seem to be going on well. The general symptoms may be far from severe. The chest may be free from pain. The heart's action may not awaken suspicion by its force or irregularity. Nevertheless, its internal lining may be inflamed, and, if you listen, the endocardial murmur may convey the momentous fact directly to your ear.

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* I do not say that it would not be fairly suspected, and that it would not be right to act as decidedly upon the suspicion in such a case as upon the matter of fact. It certainly would.

LECTURE VI.

ENDOCARDITIS CONTINUED.—ITS GENERAL DESCRIPTION LESS USEFUL THAN A CLINICAL COMMENTARY UPON ITS INDIVIDUAL SYMPTOMS.—THE ENDOCARDIAL MURMUR, IN ENDOCARDITIS, IS SOMETIMES PRECEDED BY A CERTAIN ROUGHNESS OR PROLONGATION OF THE HEART'S NATURAL SOUNDS.—OFTEN IT ARISES ABRUPTLY.—SEAT AND DIRECTIONS OF THE MURMUR.—ITS ACCOMPANIMENTS, PAIN, ABNORMAL IMPULSES, AND ACTIONS OF THE HEART.—THEIR PRACTICAL VALUE, AS SYMPTOMS, ACCORDING TO THEIR DEGREE, AND ACCORDING TO THE DIFFERENT RELATION WHICH THE ENDOCARDIAL MURMUR BEARS TO THEM IN DIFFERENT CASES.—THEIR DIVERSITIES OF RELATION CONTAIN INTIMATIONS RESPECTING THE STAGES AND PROGRESS OF THE DISEASE.—THE SAME CONFIRMED BY THE SUCCESS AND FAILURE OF REMEDIES.—THEIR PRACTICAL IMPORTANCE.

ENDOCARDITIS is one of those diseases which do not admit of general description. For what is meant by the general description of any disease? It is the display of its symptoms *collectively*, sometimes by strictly copying after nature, and sometimes using so much of artificial arrangement, as, while it goes neither beyond nor contrary to nature, may serve to make the whole more intelligible. Some such descriptions, when they have conveyed the truth with great force and faithfulness, have been regarded with the same sort of pleasure with which we look upon a well-drawn picture. But, after all, they are more pleasing than profitable. Perfection in this kind was reached ages ago, yet we go on describing what has been better described before, and are venturing with rash hands still to retouch the masterpieces of Aretæus.

But of those diseases, which have been the most perfectly described, we have not the most perfect knowledge. The physician's knowledge can then only be called perfect, when outward signs make him sure of what is going on within, and offer some plain and indubitable mark for the direction of his remedy. This knowledge, however, does not come from dwelling with satisfaction upon graphic pictures of diseases, nor from seeking to take in *all* their symptoms, and viewing them at large, but from meditating on the meaning that is wrapt up in a few.

What remains for me to say of endocarditis will be in the way rather of clinical commentary than description. I shall take its auscultatory symptom, and a few symptoms beside, and comment upon them, almost one by one, and show what is the value that belongs to each in teaching us the realities of the disease and the use of remedies.

Whenever, then, those conditions of disease arise which are apt to involve the heart, *i.e.* in all cases of acute rheumatism especially, listen to its sounds, and note in them the least change from what is natural. There may be yet no endocardial murmur. But its systolic sound may be unnaturally prolonged, or it may be unnaturally rough. Now I hardly ever knew an instance of acute rheumatism in which such unnatural length or roughness of sound, as a practised ear could well discriminate and detect, has not become an unequivocal endocardial murmur in twenty-four hours.

Those who have been accustomed to attend me in my visits to the wards of the hospital, know how often and how truly from these peculiarities in the sounds of the heart, which I have noticed for the first time to-day, I have anticipated that the murmur would be fully formed to-morrow. Experience indeed has taught me to regard them as its almost certain preludes; and thus, under the circumstances, they have become to me almost as certain signs of endocarditis as the endocardial murmur itself. I no sooner perceive them than, without waiting for the murmur, I begin the treatment of endocarditis at once.

It happens commonly, however, that the natural sound of the heart is changed into the genuine endocardial murmur, without notice or prelude. Now the murmur may be heard at the apex chiefly, or at the basis chiefly, or in both situations equally. It may, moreover, be heard in the course of the aorta and of the carotid arteries; or in the course of the pulmonary artery, and not in the aorta, or in both simultaneously; thus denoting that the seat of the inflammation may be either in the auriculo-ventricular valves or in the semilunar valves; either on the left side of the heart or on the right, or on both sides at the same time.

It has been already said that the murmur being coincident with inflammatory actions in the constitution at large, determines the disease of the endocardium to be inflammation, and that standing alone, and being the only sign directly referable to the heart, it determines the fact as surely as it would in company with a dozen other signs immediately pointing to the same organ. And in truth it sometimes *does* stand alone, and to it alone you must needs trust; and you may trust implicitly.

Often, however, it does not stand alone. Other symptoms directly referrible to the organ are superadded; pain and anguish of various degrees and kinds, excessive impulse, intermittent, irregular, faltering, fluttering action of the heart.

Now are these symptoms to be altogether rejected and passed by? Have they nothing whatever to teach in this matter, after the endocardial murmur has already taught what the disease essentially is? On the contrary, they have a great deal to teach, and therefore they are to be highly prized and made much of. In every disease seek to come at the purely diagnostic symptoms if you can, and put a high value upon them. But do not imagine that other symptoms have no value at all. You learn the disease in its essence and seat from its diagnostic symptoms. But other symptoms commonly tell you of its magnitude, and of its probable event; other symptoms sometimes become the guide of its treatment.

The endocardial murmur fixes the seat of the disease without a doubt, and conditionally determines its nature. But we gain a surer measure of its degree, and of the peril involved in it, from the pain and anguish referred to the heart, and from its disturbed and embarrassed actions.

When pain is present, the time of its first occurrence varies much in different cases. In acute rheumatism I have known patients, when questioned, admit that they suffered pain, or make voluntary complaint of it unasked (pain produced or augmented by inspiration, pain produced or augmented by pressure), in the præcordial region, while yet the ear has detected no sound of the heart which determined the seat or nature of the disease. And such pain I have known to cease altogether, without being followed by the auscultatory signs of either of those diseases of the heart which so frequently accompany acute rheumatism, endocarditis, or pericarditis. But from such pain experience would lead me to anticipate that the auscultatory signs of one or the other would quickly follow ; and prudence would lead me at once to begin the treatment of the anticipated disease.

I have mentioned a certain length and roughness of sound to which my ear is accustomed, as a frequent prelude to the endocardial murmur of endocarditis. Præcordial pain may be added to this length and roughness of sound; and, when it is, the murmur is so sure to follow, that it would be folly to delay the treatment of the disease until it arrives.

Præcordial pain occurring thus early, and after the manner specified, may serve at least as a salutary warning of what we are to expect and to be prepared for. And salutary, indeed (I am persuaded), it has sometimes been, when it has led us to act upon a strong anticipation of the disease instead of waiting for the authentic sign of its actual existence. For thus, if we have begun the treatment only a single day sooner than we otherwise should have done, we may have perfectly cured the disease which, but for the gain of this single day, would never have been more than half cured. The gain of a single day in the treatment of endocarditis is a gain indeed !

But the præcordial pain may not arise until the endocardial murmur has already informed us what disease we have to deal with, and we have already taken our measures for its cure. From the præcordial pain *thus* occurring, I do not see what new suggestions of treatment can be gained. But many new suggestions may be gained from it (as I have already intimated), according to its degree and its kind, respecting the disease itself and the peril which it involves.

In endocarditis some patients say nothing of any pain they suffer until they are asked about it, and others complain of it unasked ; while there is nothing in the countenances of either that tells you that they are suffering pain. Pain of this amount need not disturb your calculation of the result.

Others at once betray their pain by the countenance; and being questioned about it, will speak of an indescribable anguish, which they refer to the præcordial region. This is its centre, and hence it radiates; but it has taken possession of the whole nervous system. Now pain or anguish of this kind (call it what you will) deserves to be taken into serious account. It denotes that the disease has already got the springs of life within its grasp, and that going on to increase it must kill.

Just as the pain, when it is superadded to the murmur in endocarditis, gives intimations of a more or less formidable disease, so do the actions of the heart in like manner, according to the degree in which they are baffled or disturbed.

Some excess of the heart's impulse is a very common symptom of endocarditis. It often precedes the murmur in point of time, and often it rises simultaneously with it, and no sooner do you hear the one than you feel the other. It is apt to occur very early.

Not so common as excess of impulse, but still not an unfrequent symptom of endocarditis; not always so very early, but still not a late symptom of endocarditis, is an intermittent action of the heart. I think where the intermittent action occurs, it will be found generally, perhaps always, to follow an excess of impulse; and then both will exist together in the same case.

But neither from mere excess of impulse, nor from the intermittent action of the heart, if the intermissions be not frequent, need any great apprehension arise. With the advantage of early treatment, the intermittent action commonly soon subsides, and the excess of impulse not so soon, but not long afterwards, leaving the murmur alone. Upon these symptoms, however, while they remain, attention must be always steadily fixed. For, if the case have not the benefit of early and efficient treatment, or be in its own nature intractable, they are changed into disordered actions of another kind, and of formidable import: the excess of impulse passing into extreme feebleness of contraction; and the rare intermissions into small, unequal, irregular flutterings.

By the time the movements of the heart are brought to this condition, that dreadful præcordial anguish, which has been described, has already appeared; and presently the whole vascular system, and the whole nervous system, and every organ and every function which supports life, are baffled and overwhelmed. Then come orthopnœa, and lividity, and threatened suffocation, and impossibility of sleep, and collapsed features, and jactitation, and delirium, and death.

In this manner may endocarditis, announced and specially characterised by the endocardial murmur, and marked in its progress by one bad symptom after another, run on rapidly to a fatal termination. But hitherto, with all the experience of the disease which this hospital has afforded me during sixteen years and more, I have never witnessed it end thus.

But I believe such an event may and does happen, upon the credit of those who *have* witnessed it. And I believe it the more, from having myself occasionally seen a state of things which manifestly tended towards it, but which never reached it, yet which served to show me how possible it would be for endocarditis to be fatal in its acute stage.

Therefore, in every case, as soon as the murmur announces that the endocardium is inflamed, I consider that I have surely a serious, and possibly a fatal, disease to deal with; and I employ without delay the remedies upon which experience has taught me to rely for arresting its progress.

Nay, more, so important do I consider the gain of time in the treatment of endocarditis, that (as I have already said) I deem myself justified in acting upon a strong expectancy of the disease, before the murmur has yet unequivocally declared it.

The diversities of relation which the endocardial murmur is found to bear to other symptoms belonging to the heart in various cases, are well worth a little farther notice and consideration. For from remarking these diversities, and calculating together with them the success or failure of remedies, according to the time and conditions of their application, I am led to conclude that the endocardial murmur also bears, in different cases, a different relation to the actual stages and progress of the disease itself—a fact which, if it be true, must have important practical bearings.

I believe then, 1st, that in some cases of endocarditis the murmur is coincident in point of time with the very commencement of the inflammation; 2ndly, that in some, and those the most frequent, cases it does not arise until the inflammation has somewhat advanced; 3rdly, that in some, and those the least frequent cases, it does not arise until the inflammation is on the decline, or has actually ceased.

1st. The coincidence of the murmur with the commencement of the inflammation seems *thus* denoted. Upon a review of cases, I find that it was often the first symptom detected. The patients had hitherto suffered no pain or uneasiness of the præcordial region, no palpitation, no dyspnœa. But the murmur being once heard, pain, palpitation, and dyspnœa, one or all of them, quickly followed.

Here then, if ever, the murmur marks the beginning of the disease; since, if the disease existed prior to the murmur, it must have existed for a time without any symptom at all. The fact is rendered more probable from these further considerations. It was in these cases that medical treatment, promptly applied, was often successful; and it was in these cases, more frequently than in any other, that the murmur altogether ceased under the use of remedies, and so afforded the best evidence we can have of a perfect cure.

2ndly. The postponement of the murmur to a somewhat more advanced stage of the inflammation seems denoted thus. Upon a review of cases, I find that in the majority of them the murmur was preceded by other symptoms more or less referable to the heart—such as pain or anguish, palpitation or dyspnœa; and that an interval of from one day to a week was apt to elapse between the first appearance of such symptoms and the subsequent accession of the murmur.

Now, although the symptoms enumerated could only direct suspicion to the heart, and had they passed away without any accession of the murmur, it must have remained doubtful in what manner the heart had been affected, or whether it had been affected at all, yet the murmur, when it at length arrived, became the sure interpreter of all that preceded it. It declared the other symptoms to proceed from the same disease as itself, —viz. endocarditis; and that this disease had existed as long as they had existed, and for some time before it became audible.

The effects of remedies in these cases, both by their success and their failure, pointed distinctly to the same conclusion.

There were among them examples of perfect cure; these were the cases in which the murmur was preluded for a day or two by præcordial pain, palpitation, and dyspnœa *coming on while the patients were already under medical observation.* These, as soon as they appeared, served as signals to direct the remedies to the heart. Thus the treatment of the endocarditis was instituted in anticipation of the disease, before its authentic sign had yet arisen and determined its undoubted character I say, in anticipation of the disease—I ought rather to say in anticipation of our own certain knowledge of it; for the murmur after the lapse of a few days arose, and thus distinctly marked the nature and seat of the disease. But in a few days it ceased, and thus distinctly marked the perfection of the cure.

Again, among the cases belonging to this class there were many of imperfect cure. These were those in which the murmur was preluded for a longer time by præcordial pain, palpitation, and dyspnœa, which *came on before the patients were yet under medical observation.* It was not uncommon to find in the subjects of acute rheumatism that præcordial pains and palpitations had existed for two or three days before their admission into the hospital, and yet there was no murmur; and that these præcordial pains and palpitation would still continue for two or three days after their admission, ere any audible roughness or murmur was detected. Here the treatment was instituted at the earliest period possible under the circumstances, and was still beforehand with *our knowledge* of the disease; but it was too late for the *disease itself.* At length the murmur arose, showing what all the previous symptoms meant, and declaring the disease, both what it was and where it was, and sanctioning its conjectural treatment. But having arisen, it never ceased, and thus distinctly marked the imperfection of the cure.

These facts hardly leave it doubtful, that endocarditis and all its essential morbid processes, as well as the opportunity of its treatment, are often comprised within a period prior to any audible murmur; that even within this period the disease begins and advances, and often proceeds so far as to do an irreparable injury to the endocardium; and that within this period the opportunity of its treatment must be promptly seized to be successful, and that, if tardily used it, will even then fail.

3dly. That sometimes the murmur does not arise until the inflammation is on the decline, or has actually ceased, seems very probable from the following considerations. There were a few well-watched cases in which this happened. During the progress of the rheumatic fever and the patient's confinement to bed, no murmur was audible; but when the fever and the rheumatism had ceased, and the patient had left his bed and was walking about the ward, and was already deemed convalescent, then the murmur was for the first time audible. In these cases, any previous symptoms which could intimate a possible suspicion of the heart being affected were very slight, and had yielded to slight remedies, or no such symptoms were either noticed or treated at all.

The endocardial murmur arising under these circumstances was unchanged by medical treatment. It remained as long as the patients continued under observation.

The inference from such an event is clearly this,—that an inflammation of the endocardium had accompanied the rheumatic fever; that this inflammation was of small activity, and insufficient during its progress to interfere with the natural sensations and movements and sounds of the heart, but enough in the end to produce by its effects some permanent inequality on the surface of a valve, and a permanent murmur as the sign of it.

Now, if the foregoing facts be true, and the conclusions from them be just, they will help us greatly in estimating the real value of the murmur as a sign diagnostic of inflammation of the endocardium, and as a guide for its treatment.

And its value must vary exceedingly in both respects, according to the period of the inflammation at which it becomes audible. When the murmur is itself the first symptom, or among the first symptoms, of endocarditis, then it has its highest possible value both for diagnosis and treatment. It makes us sure of the disease as soon as it begins to exist, it makes us bestir ourselves for its cure when it is most within reach of a remedy.

But when the murmur is not audible until the endocarditis is considerably advanced, and until it has already been preceded for some days by other symptoms, doubtless it is still diagnostic of the disease, and is still a guide to its treatment; but its practical value in the individual case is diminished. For now, did we wait for the murmur to tell us what the disease is and how to treat it, it would inform us indeed at last with more certainty than any other sign; but we should come in with our knowledge and with our remedies when they were too late. But we do not wait. Our experience of the frequency with which the murmur follows such and such symptoms referable to the heart, arising in the course of acute rheumatism, makes us regard them as its sure precursors, and makes us act as if it were already present, and begin the treatment of endocarditis while it is yet not quite certain whether the disease be endocarditis or no. Here the value of the murmur is indeed very great, in a certain point of view. Its value is not shown by the use we make of it for the diagnosis and the treatment of the very case in which it occurs, but by the use we make of our foregone experience of it in other cases, which we are now turning to such eminent profit in this. The murmur, when it at length arises in the individual case, only serves to show, that the conjecture which we formed from the more equivocal symptoms, concerning the existence of endocarditis, was right, and that the treatment instituted upon that conjecture was right also.

Further, when the murmur is not audible until the endocarditis is on the decline or has actually ceased, it is of no use whatever, either for the diagnosis or treatment of the disease as an inflammation. The inflammation is gone by, and the murmur denoted nothing about it during its progress. But it is diagnostic of its effects, which remain and are permanent. Whatever use and interest it now may have, they belong to it as marking the commencement of a series of pathological changes which are yet to come. For it ascertains beyond a doubt the time, and the nature, and the seat of the first rudiment of disorganisation, which will in the end probably involve the whole heart.

LECTURE VII.

PERICARDITIS.—THE EXOCARDIAL MURMUR ITS PRE-EMINENT SIGN.—AN IMPERFECT MURMUR SOMETIMES PRECEDES THE TRUE.—IN PERICARDITIS, AS IN PLEURISY, ANOTHER AUSCULTATORY SIGN BESIDE THE MURMUR, DULNESS TO PERCUSSION.—THEIR RELATION TO EACH OTHER NOT EXACTLY THE SAME IN THE TWO DISEASES.—IN PERICARDITIS OTHER SIGNS IMMEDIATELY REFERABLE TO THE HEART, BESIDES THE AUSCULTATORY: VIBRATIONS SENSIBLE TO THE TOUCH, UNDULATIONS TO THE EYE.—OTHER SYMPTOMS OF PERICARDITIS.—THEIR RELATION TO ITS AUSCULTATORY SIGNS.—FROM THESE OTHER SYMPTOMS, AND CHIEFLY FROM ITS KNOWN CONNECTION WITH ACUTE RHEUMATISM, PERICARDITIS OFTEN RIGHTLY PRESUMED TO EXIST, AND OFTEN SUCCESSFULLY TREATED; YET OFTEN OVERLOOKED, AND OFTEN TREATED TOO LATE, AND OFTEN FATAL, FOR WANT OF THE AUSCULTATORY SIGNS.

Before the exocardial murmur was made out and verified, and clearly discriminated from all other signs referable to the heart, there was no certain diagnosis of inflammation of the pericardium. The subject is one in which I had myself taken a peculiar interest, and had done my best to gain accurate information. But I am now fully aware, that for a series of years half the cases at least which I regarded as inflammation of the pericardium were in fact inflammation of the internal lining.

Surely a lasting debt of gratitude is due from mankind to those who shall discover an unerring sign of any disease. The more so if the disease be of a formidable nature. The more so still if the sign declare the disease early enough to bring our knowledge of its existence fairly within the period that will allow it to be successfully treated by medicine. All this may be considered predicated of the sign in question and of the disease it indicates—of the exocardial murmur and inflammation of the pericardium: and our debt of gratitude is due to Dr. Watson and to Dr. Stokes of Dublin; for these two eminent physicians pursued their enquiries independently and successfully to the same result. Among the great variety of auscultatory signs referable to the heart in its different states of disease, they discriminated the attrition-sounds and set them apart from all the rest, until finally, by experiment, they referred them to their proper source, and fixed the conditions of their production in the pericardium.

But there are other sounds which, prior to experience, would hardly have been suspected to proceed from the pericardium, but which, nevertheless really do so. These sounds cannot, like the ordinary exocardial murmur, be imitated by any simple device that I am acquainted with. They are said to be like the crumpling of parchment, the creaking of shoe-leather, the churning of milk. And I must leave them to be represented by these similitudes without attempting to describe them; for I am quite sure that by no description I could give, and by no similitude to which I could refer you, would you be at all the better able to recognise the sounds when you should first hear them. You must wait till you hear them yourselves; and then you will most likely be puzzled until you are told what they are.

Any one remembering what has already been said of its similitude to the sound produced by rubbing the hands together, or the cuffs of your coat, or two pieces of strong paper; also of its sensible nearness to the ear when it is applied to the præcordial region; also of its conveyance to a distance over the chest, and its non-conveyance in the course of the aorta and carotids; any one from this description would at once recognise the true exocardial murmur on first hearing it, and pronounce that the disease was pericarditis.

But (what for want of better names I must call) the crumpling, creaking, churning sounds require to be more frequently heard, before they are familiarly known and recognised. Yet an acquaintance with them is most important and most necessary. For they as surely indicate the presence of pericarditis as do the more perfect ordinary exocardial murmurs.

One fortunate circumstance, however, belongs to these indefinite and less perfect sounds, which greatly diminishes the chance of evil that might be supposed to arise from a doubtful or postponed decision respecting their exact import as diagnostic signs. It is this:—wherever any one of them arises in consequence of pericarditis, it becomes changed, in the course of one or two days, completely or partially, into the genuine exocardial murmur. It is either merged entirely in it, or partakes enough of its character to leave its import no longer doubtful. And then the genuine murmur being once established continues such thenceforward through the whole course of the disease, or only changes its character a few days before its final disappearance.

Touching these indefinite sounds referable to the heart in acute rheumatism, there is another circumstance which is worth a particular notice. It is this—that they will sometimes come and go for two or three days, and then cease altogether, or then become permanent.

For an important fact, not prominent in itself, it is often difficult to gain the attention it deserves, unless you invest it with the circumstances of actual practice. Let me do so for the fact in question. This then has several times happened. A clinical clerk, having charge of a case of acute rheumatism, has distinctly heard an unnatural sound at a certain space of the præcordial region, and two or three other students have heard the same as distinctly as himself. The space has been a small space, and they have marked it with a circle of ink that they might the more easily find it again. At my visit to the hospital some time afterwards my attention has been called to the fact; but no such sound could I hear, and those who have heard it before have confessed that they could not hear it now. But I have returned to the same patient in half an hour, and then I have heard it, and everybody else has heard it distinctly and at the very spot indicated.

Now, these sounds of an indefinite kind, belonging to acute rheumatism, which are restricted to a small præcordial space, and are now audible and now inaudible several times a day for two or three days together, and then either become constant or entirely cease, always proceed, I believe, from the pericardium. For, when they become constant, they gain the character of the ordinary exocardial murmur, and spread themselves widely over the præcordial region or beyond it.

In the cases where the sounds ultimately cease without becoming either more pronounced or constant, and without occupying a larger space, it is reasonable to believe the disease still to have been pericarditis, but of small degree and extent.*

In connection with the more or less perfect exocardial murmur, many circumstances remain to be noticed which are of great interest, and which serve further to illustrate the pathology and diagnosis of inflammation of the pericardium.

You recollect the history formerly given of the attrition-sound occurring in the course of pleurisy;† how it arose at one period of the disease, ceased at another, and returned again at a third. The solid products of inflammation, the lymph, upon the opposite surfaces of the pleura, first produced the sound. The fluid products of inflammation, the serum, in the cavity of the pleura, obliterated it. And the absorption of the serum from the cavity, while the lymph still remained upon the surfaces, caused it to return.

Now in pericarditis there are the fluid products of inflammation as well as the solid. There is serum as well as lymph. And the signs of fluid effused within the pleura and the pericardium are the same. The fact of its existence, and the measure of its accumulation within the pericardium, can only be known by the degree and extent to which the præcordial region, and perhaps some space beyond it, may be dull to percussion. Thus in pericarditis dulness sometimes occupies a part and sometimes the whole of the præcordial region; sometimes it reaches beyond the præcordial region, as high as the second, and even the first left rib; sometimes it extends beneath the whole length of the sternum, except about an inch at the top, and even beneath the cartilages of the ribs on the right side.

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* I would not willingly represent the diagnosis of the seat of disease within the heart by the quality of its abnormal sounds, as more easy, or more constant, or more absolutely sure than it really is. Notice is hereafter (page 86) taken of certain cases, in which it could not be determined whether the inflammation was of the endocardium or of the pericardium. Dr. Bence Jones informs me, that at St. George's Hospital he has sometimes found no distinction possible between the endocardial and exocardial murmurs themselves; and that then the variations of sound, from day to day, and even from minute to minute, and often in consequence of change of position, have afforded him the means of recognising inflammation of the pericardium.

† In the course of lectures given at St. Bartholomew's, those on pleurisy preceded those on diseases of the heart.

Surely, then, this dulness to percussion is a most important sign, and hardly inferior to, and hardly less diagnostic of, the pathological conditions to which it points, than the exocardial murmur itself.

But do these two, viz. the murmur and the dulness, bear the same relation to each other as signs of disease within the pericardium, as they have been seen to bear as signs of disease within the pleura? In pleurisy the attrition-sound and the dulness are never coincident, but are always found to supersede each other, one ceasing as soon as the other arises. Is this the case in pericarditis? My own experience would answer almost absolutely "No!" As soon as I have discovered the exocardial murmur at any part of the præcordial region, so soon have I almost always found dulness to percussion. And, to whatever extent the dulness to percussion has spread beyond the præcordial region, the murmur has accompanied it, even as high as the first left rib, and beneath the sternum, and far beyond it, even to the juncture of the cartilages with the right ribs. Further, I have known dulness of the præcordial region to be the *first* sign, and to subsist several days *alone*, and yet the attrition-sound has at length been superadded to it, when they have thenceforth been continued together. In pericarditis, then, this I take to be the *general* truth, namely, that the murmur, which is produced by lymph, deposited upon the surfaces of the membrane, is neither abated, nor abolished, nor otherwise altered in its character by the serum effused within its cavity. It is not, however, the *universal* truth.

Indeed, I have seen a few instances of pericarditis, where the murmur, clearly heard day after day, has at once become very indistinct, or has been suddenly lost altogether. The disease has been at its greatest activity, and the heart at the very time has suffered some extraordinary bafflement of its actions. But the sound, thus abated or abolished, has suddenly returned, and in a day or two has been as perfect an exocardial murmur as it was before, and then the heart's actions have recovered their regularity. In these instances the remedy which has thus instantly relieved the heart and restored the sound has been a large blister vesicating the whole præcordial region, and a wide space around it.

Now dwell a little thoughtfully upon these instances, and upon the several attendant circumstances, both when the sound goes and when it returns, and above all, upon *the remedy*, and its immediate effect; and then say what they can denote, but now a sudden increase, and now a sudden decrease, of fluid within the pericardium?

But still, if the common experience be in accordance with my own, and if my own speak the truth in this matter, the fact will be, that serous effusion within the pleura *always* obliterates the attrition-sound, and that serous effusion within the pericardium *generally* leaves it unaltered. Now there must be some way of accounting for so different a result from conditions apparently the same. The following considerations, perhaps, point out a way that is plausible at least.

Fluid within the pleura exercises its pressure upon the most yielding organ of the body, the lungs. They make no resistance, but, shrinking in their dimensions, and giving place more and more as the fluid increases, they recede further and further from the ribs, until at length they are forced into an incredibly small compass by the side of the vertebral column, impervious to air and useless, but in themselves perfectly free from disease.

But fluid within the pericardium produces no such effect upon the heart by its pressure. The heart, of all organs of the body, is the least yielding. It is the pericardium that now yields. But then, in the greatest accumulation of fluid within it, the space intervening between the pericardium and the heart will bear no comparison with that between the pleura and the lungs in ordinary cases of pleurisy. Further, when in pericarditis death has taken place while the inflammation was progressive, dissection has generally found as much solid as fluid matter within the pericardium, and sometimes even more lymph than serum. The heaped-up, curdled albumen covering the entire heart, and adherent to, or pendulous from, the loose pericardium, would make it appear that the interposed serum (which itself contains flakes of lymph) was not enough to prevent the opposite surfaces from touching and rubbing against each other, and so to prohibit the murmur.

In the few cases where the dulness to percussion supersedes the murmur, or greatly alters its character, it is probable that the fluid products of inflammation exceed the solid, that the serum exceeds the lymph, in an unusual measure.

The exocardial murmurs of more and less perfect character, and the dulness to percussion of the præcordial region, and of more or less space beyond it, are strictly auscultatory signs, being both equally learnt and appreciated by the ear. It is with such that I am now principally concerned. But I may be permitted perhaps to conjoin with them two other signs, directly referable to the heart, indicating the same conditions of disease and often found in their company, but learnt and appreciated by an appeal to other senses.

In pericarditis, while the præcordial region is dull to percussion and the exocardial murmur is heard, an undulating motion often becomes visible to the eye in some of the spaces between the cartilages of the ribs on the left side. It has always been either between the cartilages of the second and third ribs, or of the third and fourth, or between both at the same time, that I have seen this motion, and never in any other situation.

So, too, in pericarditis, while the præcordial region is dull to percussion and the murmur is heard, a vibratory motion often becomes sensible to the touch in some of the spaces between the cartilages of the ribs on the left side. As I never *saw* the undulatory, so I never *felt* the vibratory, motion elsewhere than either between the cartilages of the second and third, or of the third and fourth ribs, or between the cartilages of both simultaneously.

The vibration (I believe) is the more frequent of the two, and often occurs unaccompanied by any visible undulation. But the undulation was never apparent to my eye without my finger being able to detect a sensible vibration at the very same spot.

It is hardly necessary to give a formal explanation of these phenomena. It is no unusual thing that the same vibrations which convey sounds to the ear should make themselves sensibly felt by the touch, or that a fluid should impart its own undulatory motion to contiguous bodies.

Now these two signs, which address themselves respectively to the sight and to the touch, are simple, direct, and easily apprehended, but inferior in value, both to the murmur and to the dulness on percussion, as pointing out inflammation of the pericardium. Neither the vibration to the touch nor the undulation to the eye are always present. Many a case of pericarditis has passed through its entire course without either one or the other manifesting itself. So that, if we depended altogether for our diagnosis upon either or both, pericarditis must often go undiscovered.

Again, where they *do* appear, it is not (as far as I observe) ever at a very early period of the disease. So that, though they might afford a sure diagnosis enough, it would be less practically valuable as coming late, when the time for the most efficient treatment of the disease is past.

But fortunately our diagnosis of pericarditis need never depend upon them; and more fortunately still, our diagnosis is already settled before they appear. For in pericarditis (as far as I have observed) they never occur but as accompaniments of the exocardial murmur and the præcordial dulness. And farther, when they do occur (as far as I have observed), they always appear later, and cease earlier, than these do.

There remains another observation to be made in calculating the just value that belongs to one of the two signs in question, viz. the vibration conveyed to the touch between certain intercostal spaces. It is occasionally present in more diseases of the heart than one; in disease of the semilunar valves, whether of the pulmonary artery or of the aorta, as well as in inflammation of the pericardium. Which disease it indicates, and in which situation, must be determined by the concurrent circumstances of the particular case.

It would not then perhaps be unjust to conclude that the exocardial murmur and the præcordial dulness are supreme in the diagnosis of pericarditis; and that they neither receive nor require any aid from other signs directly referable to the heart, though such (it appears) there are, which are as simple, and as plainly cognisable by other senses as themselves are by the ear.

Thus far I have been dealing with these auscultatory signs analytically; setting them apart, and describing what they are in themselves, explaining the mode of their production, and the conditions out of which they arise, and comparing them with others that might seem to hold competition with them. And perhaps I have thus made them as intelligible to you as in this manner they can be made. You may now understand their proper sphere of diagnosis, and their just value *upon the whole.*

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But, for the great uses they are to serve, you must become acquainted with them in their accustomed complications, and mixed, as nature mixes them, with the events and circumstances of actual practice.

My own experience of pericarditis is mainly derived from what it is, as an accompaniment of acute rheumatism. I have seen the disease, indeed, under other circumstances. But it has been very seldom; so seldom, indeed, that I have little acquaintance with other conditions external or internal conducing to it. I can neither tell whence to look for it nor when to expect it, except when it occurs as a part of acute rheumatism.

The pericarditis, which is acute and rapidly progressive, and, unless arrested by timely and effectual treatment, full of peril, this is the pericarditis I mean. And with this the practice of a large hospital has rendered me familiar by presenting me every year with numerous instances of it in alliance with acute rheumatism. But, separate from acute rheumatism, even the practice of a large hospital does not present me with more than an instance or two of it in several years. And, as of the disease itself, so of all the symptoms and auscultatory signs by which I learn its existence and direct its treatment, my chief knowledge comes from acute rheumatism.

In analysing the sources of our knowledge, let us be just in allowing to all times and to all methods of investigation their due merit. It ill beseems that impartiality which ought especially to characterise every enquiry after such truths as we are engaged in, to be bent upon depreciating the labours of the past age and exalting those of the present, or disparaging old methods of research and praising new ones. Pathology and practical medicine had assuredly made some respectable advances before we were born, and before physicians had found out all the uses of their ears, and of the stethoscope.

Long before auscultation was practised, physicians knew a great deal about inflammation of the pericardium. They knew well the pathological conditions of the constitution at large out of which it is most prone to arise, and consequently when to expect it. They knew well when to infer its existence from such symptoms as were within their reach. They knew well how to treat it, using all the same remedies that we do now, and directing them to fulfil the same indications. Finally, they knew well all its consequences. Long before auscultation, pericarditis had a good claim to be considered one of those diseases which was tolerably well understood.

Now that which served our predecessors as the basis of all they knew clinically concerning pericarditis was the general fact of its alliance with acute rheumatism. This fact, so sure and well authenticated, gave an interpretation and a meaning to many equivocal circumstances, and placed them, for the time, almost in the rank of diagnostic symptoms.

The direct symptoms from which they inferred its existence were these;—pain in the præcordial region, often augmented by pressure, anguish, and oppression of breathing, and an irregular or intermitting action of the heart. But these symptoms are not very precise; they have been found in other diseases of the heart, and in diseases of other thoracic organs. It may seem strange, then, that physicians having only these to guide them should be able to detect pericarditis so often and so surely as they did. But then (I repeat) they knew the conditions under which pericarditis was apt to occur; and, when those conditions arose, they were perpetually upon the watch for it. And thus when, in the midst of acute rheumatism, there arose a præcordial pain, an anguish of respiration, and an irregular action of the heart, they interpreted them to denote pericarditis, and they were generally right.

They were right, *when these signs occurred in acute rheumatism*, in concluding them to mean pericarditis; but, *when in acute rheumatism not one of these signs occurred*, and the pericarditis existed nevertheless, they overlooked the disease; and they could not help but overlook it. And when (what more frequently happened) these signs occurred indeed, but not until the pericarditis had already existed many days, they did not overlook it, but they gained too late a knowledge of it, much precious time having been already lost to its treatment. Thus pericarditis has indeed been entirely overlooked by myself, and by better men than myself; overlooked when we were most upon the watch for it, under circumstances most conducive to it, even as the accompaniment of acute rheumatism. The inflammation has been severe, and, being unarrested by any remedy, it has run on rapidly to its fatal termination; and after death we have stood amazed at the disease disclosed to our eyes by dissection.

These are events of past years. In such unfortunate cases there was neither præcordial pain, nor respiratory anguish, nor irregular pulse; and the auscultatory signs of pericarditis were as yet unknown. But the like mistakes could hardly occur *now*; it is scarcely possible that pericarditis coming on just at the suspected time, and just under the suspected circumstances, could *now* be overlooked. Every prudent physician, I presume, searches after it day by day with his ear in all cases of acute rheumatism; and though the heart itself show no vital consciousness of its ailment either by feeling or function, by pain or palpitation,—though the organs in closest relation with the heart, the lungs, feel nothing, suffer nothing, and declare nothing, and so there be no dyspnœa, yet will the *mere mechanism* of the disease proclaim the fact of its existence to the ear.

By reason of its perfect lubricity, the healthy pericardium carries on the movement of its surfaces upon each other in perfect silence. It is enough to make their movement audible if inflammation do but spoil this perfect lubricity, and as soon as inflammation produces ruggedness and inequality, the movement is accompanied by harsh sounds.

Still, of an acute and severe rheumatic pericarditis running on to its fatal termination, absolutely unattended from first to last by any symptoms except the auscultatory, the examples, I believe, are very rare; few at any time have died of it without any attempt to save them. The victims of an undiscovered and untreated pericarditis are few; but the examples (I am persuaded) are by no means rare of an acute and severe rheumatic pericarditis progressive for many days, and unattended in the meantime by any but auscultatory symptoms, other symptoms, however, arising at last; and many such cases (I am persuaded) were fatal *formerly*. The best treatment commenced as soon as the only symptoms then understood had declared themselves, came too late; and many such cases would be fatal *now*, did not the first attrition-sound from the præcordial region call into instant use the remedies by which we deal with pericarditis.

My experience tells me, that in acute pericarditis the fluttering, faltering action of the heart, and, with it, the respiratory anguish, are almost sure to occur, but that the time of their occurrence is almost always late, and that the murmur and the præcordial dulness always precede them.

But my experience tells me, that in acute pericarditis the pain, if it occur at all, almost always occurs early. The first access of inflammation generally produces it as well in the pericardium as in other parts. Yet, early as is the pain, the murmur is often earlier.

But of all symptoms mere pain is the most inconstant and uncertain, whatever be the disease. It is so in pericarditis. It is present in one case, and absent in another strangely and unaccountably. I have known much pain, when the disease has been of little severity, of short duration, and of easy cure: and I have known the severest pericarditis pass through all its stages without pain. All other symptoms have been present to mark its reality and its progress: the murmur and the præcordial dulness, and the fluttering heart, and the respiratory anguish. And sometimes the patient has died, and sometimes he has escaped by a tardy and precarious convalescence. But from first to last there has absolutely been no pain.

Do not be surprised at this. Pleurisy may exist without pain; even acute, rapid, pus-effusing pleurisy. Peritonitis may exist without pain; even acute, rapid, pus-effusing peritonitis. And so, too, if in pericarditis there is sometimes no pain, it fortunately happens that there are other signs by which we can fix our diagnosis of the disease equally well without it.

See what a strange, unequal, and uncertain light pain is found to throw upon diagnosis and treatment! We find it where we do not look forit, and look for it where we do not find it. Its presence is no sure proof, its absence is no sure negation, of disease.

But still pain is a most important symptom. Where there is pain, we should always think of disease, always search after disease, and always require strong circumstances to convince us that disease does not exist. Where there is no pain in a part suspected of disease, we should never on that account conclude it to be healthy, and never be content until we find other circumstances to convince us that it is really so.

LECTURE VIII.

THE FREQUENCY OF ENDOCARDITIS AND PERICARDITIS, OCCURRING SEPARATELY OR TOGETHER, AS THE ACCOMPANIMENTS OF ACUTE RHEUMATISM.—PRESENT RESULTS OF ENDOCARDITIS OCCURRING ALONE.—OF PERICARDITIS OCCURRING ALONE.—OF BOTH OCCURRING TOGETHER.—DIFFICULTY OF GAINING KNOWLEDGE OF THEIR ULTIMATE RESULTS, WHEN THE CURE IS IMPERFECT.

Between the years 1836 and 1840, both inclusive, there occured under my care at St. Bartholomew's Hospital 136 cases of acute rheumatism:

Of these 136 patients 75 were males, and 61 were females; of the 75 males the heart was affected in 47, and unaffected in 28.

Of the 47, the seat of disease was the endocardium alone in 30: the pericardium alone in 8: and both the endocardium and the pericardium in 7. And, while the heart was undoubtedly affected in 7 others, the exact seat of its disease was uncertain.

Of the whole number of males in whom the heart was thus variously affected 8 died. And in these 8 the pericardium and the endocardium were both inflamed.

Of the 61 females the heart was affected in 43, and unaffected in 18.

Of the 43, the seat of disease was the endocardium alone in 33; the pericardium alone in 4; and both the endocardium and the pericardium in 4; and the exact seat of the cardiac disease was doubtful in 2.

Of the whole number of females in whom the heart was thus variously affected none died.

The account of males and females taken together will stand thus:

Cases of acute rheumatism	136
Heart unaffected in . . .	46
Heart affected in	90

Seat of disease in the heart :—

Endocardium alone in	63
Pericardium alone in	7
Endocardium and pericardium in . .	11
Doubtful in	9

Deaths 3. In all of whom both the endocardium and the pericardium were affected.

Here are momentous facts which go (I suspect) a good deal beyond the ordinary notions entertained by medical men of this matter. It is believed that among the sufferers of acute rheumatism an individual now and then unluckily has his heart inflamed. The thing is looked upon as an accident which, if not very rare, yet is not very common. But it appears, from the event, not of a dozen or twenty cases merely, but of a number large enough to furnish the measure of what naturally belongs to the disease, that as many as two-thirds of those who have acute rheumatism also suffer inflammation of the heart.*

Further, the pericardium is popularly regarded as the special and most frequent seat of the inflammation which takes its rise from acute rheumatism. But it appears from cases sufficiently numerous, that endocarditis occurs nine times in acute rheumatism, for pericarditis once; that simple endocarditis constitutes more than two-thirds of all rheumatic cardiac affections, and simple pericarditis only one-thirteenth; and that pericarditis is more frequently found in combination with endocarditis than alone.

Next we come to the results of these cases. And there are many results worth inquiring about; but, when the disease is inflammation, and the part affected is vital, everybody first thinks of the great result in present death or recovery, and asks what are the hopes of life and what the fears of death.

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* It has been suggested to me that, in the records of my practice at St. Bartholomew's, there would probably be found a somewhat greater frequency of endocarditis and pericarditis, as the concomitants of acute rheumatism than is usually observed; and that this might be owing to the sedulity of my clinical clerks, who were ever on the alert to gain admission into my wards of (what were esteemed) interesting cases, and that thus I might get more than my share of rheumatisms in which the heart was affected. I cannot exactly tell how this may be, but I hear all physicians of public hospitals speaking of the heart being affected in acute rheumatism with a frequency far beyond the common belief.

The proneness of the heart to inflammation in rheumatic fever may not be at all times the same. It may belong to (what Sydenham would call) the epidemic constitution of a certain series of years.

Now, you already know that out of the 90 cases of cardiac disease occurring in the course of acute rheumatism, cases of simple endocarditis, and cases of simple pericarditis, and of both mixed, and of some doubtful, only three deaths are recorded. Well, then, have all these pains and all this care of diagnosis been thrown away upon a class of diseases which, albeit they are of a vital organ, prove fatal only in one case out of thirty?

But besides the great result of present death, or recovery from the present inflammation, there are other results, practically and pathologically important in the highest degree, which auscultation and auscultation alone has enabled us to trace and to appreciate.

The results of simple rheumatic endocarditis were these:—

Of the 63 patients who suffered simple endocarditis in the course of acute rheumatism, 30 were males and 33 were females, of whom none died. And if the sort of subjects we have to deal with in a London Hospital be considered, their different habits and constitutions, which are bad in the majority, and the disadvantages of their postponed treatment, so common in the acute diseases of the poor, it must be confessed that the endocarditis of acute rheumatism does not involve much immediate peril of life, when of all the cases of this disease, 63 in number, which occurred in the course of five years, not a single one was fatal.

But of these 63, whom the endocarditis did not kill, and who as far as general symptoms could be trusted, might be pronounced convalescent or well, auscultation still told us that, after the inflammation had ceased, the membrane recovered its complete integrity of structure only in 17, and that it remained permanently injured in 46. For of the 30 males, the subjects of rheumatic endocarditis, the endocardial murmur ceased entirely only in 8; while it remained, after they were convalescent, and as long as they continued under observation, in 22. And of the 33 females the endocardial murmur ceased entirely only in 9; while it remained in 24.

Thus, while inflammation arrested and life saved in all the cases which occurred, even 63 in number, do indeed sufficiently testify how small is the present peril of life from rheumatic endccarditis, yet the entire restoration of the endocardium to its perfect structure in 17 only, and the permanent injury done to it in 46, denote a most fearful disease in regard to its distant results. For the probability is as great as four to one, that inflammation befalling the endocardium will become the rudiment of disorganisation to the entire heart.

The results of simple rheumatic pericarditis were these:—

Of the 7 who suffered simple pericarditis in acute rheumatism, 3 were males and 4 were females, of whom none died. Life was saved in all. Inflammation was arrested in all; and all resumed the general conditions of health. Neither, after inflammation arrested and life saved, did it happen to any one of these cases of pericarditis, as it did to 46 out of 63 of endocarditis; not in a single case did the exocardial murmur remain after convalescence to denote a still abiding change of structure in the pericardium, as the endocardial murmur had remained, and denoted permanent disorganisation of the endocardium in so many cases of endocarditis.

But were all these cases of pericarditis perfectly cured? After the inflammation ceased, was there no remnant of injury in any case where there was no exocardial murmur to denote it?

In pericarditis, when the exocardial murmur entirely ceases, we have not the same strong grounds for believing that the pericardium has both lost its inflammation and recovered its healthy condition, as we have in endocarditis, when the endocardial murmur ceases, that the endocardium is quite sound again. These two auscultatory signs, referable to the internal and external membrane of the heart respectively, cannot be taken equally to imply the same things both when they come and when they go. When they come, they both equally denote new matter deposited, the one upon the endocardium and the other upon the pericardium. But when they go, they do not both equally denote that the newly deposited matter has been removed. When the endocardial murmur ceases, it does denote as much; when the exocardial murmur ceases, it does not. For the endocardial murmur could not cease, while the lymph still remained on the endocardium to produce the obstruction to the blood which caused it. But the exocardial murmur could cease, while yet the lymph remained on the pericardium. For its opposite surfaces might by the same lymph be made to adhere, and thus the cause of the murmur would be removed.

Hence, therefore, out of the 63 cases of simple endocarditis, in which inflammation was arrested and life saved, I feel absolutely certain that the cure was perfect in 17; a small proportion, indeed! while out of the 7 cases of pericarditis, in which inflammation was equally arrested, and life saved, I have no assurance whatever that the cure was perfect in a single one.

But although in these and in all cases of acute pericarditis there is nothing *certain* beyond the immediate result of the treatment in arresting inflammation and saving life, there may be something *probable* as to the condition in which the inflamed parts are left, and as to the perfection or imperfection of their cure.

What is probable, then, is this, that, whenever the pericardium is acutely inflamed, and lymph enough is deposited upon it to produce the exocardial murmur, the cure seldom amounts to a complete restoration of its natural structure, but that the whole, or some considerable portions of its opposite surfaces, permanently adhere. This is probable from the nature of the disease itself, and of the serous membrane which it implicates. And it is much more probable from what actually occurs in many cases. For after the exocardial murmur has long ceased, and the patient is deemed convalescent, signs directly referable to the heart will often remain or arise, showing that the organ is not at ease—that it still sustains an injury which baffles and restrains the freedom of its natural actions. The signs, taken alone, are not enough to define the injury, either what it is, or where it is; but taken in connection with the previous disease they are quite enough. They denote that the permanent injury has the same seat as the previous disease, viz. the pericardium, and that it consists in that change of structure to which inflammation of the pericardium naturally tends, viz. adhesion of its folds.

In 4 of the 7 cases of simple pericarditis, I find the following records made just before the patients passed from under my observation, and left the hospital:—1. "Sounds of the heart not distinct one from the other."—M. 31, 181.

2. "Sounds of the heart as if muffled."—W. 22, 4.

3. "Increased impulse of the heart for a month after the exocardial murmur had ceased, and as long as the patient remained under observation."—W. 25, 121.

4. "Præcordial region presents a greater extent of dullness to percussion than natural."—W. 26. 121.*

The results of rheumatic endocarditis and pericarditis combined in the same subject were these:—

Of the 11 in whom endocarditis and pericarditis were combined, 7 were males and 4 were females. Out of these, inflammation was arrested, and life saved in 8; and 3 died. Of the 8, who were convalescent from this double disease, one of the structures inflamed, the endocardium, underwent perfect reparation in 2, for the endocardial murmur entirely ceased; and imperfect reparation in 6, for the endocardial murmur continued. As to the other structure inflamed, the pericardium, although the exocardial murmur ceased in all, it is doubtful whether its reparation was perfect in any. Probably there remained a greater or less extent of permanent adhesion.

Thus of these 8 cases of double disease, or of inflammation involving the two structures of the heart, I am not sanguine enough to believe that the organ recovered a perfectly healthy condition in a single instance. For in the 2, where, doubtless, the endocardium was perfectly restored, the pericardium probably adhered; and in the 6, where, doubtless the endocardium was permanently injured, the pericardium probably adhered also.

In the 3 fatal cases, the auscultatory signs denoting inflammation of the endocardium and pericardium were well marked, and on both membranes dissection disclosed the recent effects of inflammation, when it is arrested in its mid progress by death.

I subjoin an account of them which you may take as specimens of the disease:—

In one case the folds of the pericardium were universally adherent, but were easily separated. The connecting lymph was peculiarly vascular over the left ventricle, and being detached, discovered some spots upon the surface of the heart which looked like pus. The endocardium bore marks of inflammation on both sides of the heart. On the tricuspid valve, at a little distance from its free edge, was a spot, one-third of an inch in diameter, pink in the centre, and surrounded with a white elevated border. On the mitral valve were small pearly bodies, about the size of millet seeds, fringing its free edges. The aortic valve was thickened and of a pinkish colour, and displayed upon its surface, a little below its free edges, bodies of the same form and size as those found upon the mitral valve. The general bulk of the heart and the capacity of its cavities were natural, and its muscular substance had the appearance of health.

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* The letters and numerals here and elsewhere denote the volumes and pages of my own MS. case-books. I am aware that they can now afford no help to the reader, since they do not refer to documents open to his consultation. Still, at some future time the cases may be recorded, and then the references will be of use.

Here the exocardial murmur ceased twelve days before the patient's death. But the endocardial murmur continued, until the symptoms of dissolution arose, and the movements of the heart were too feeble to make it audible.—M. 25. 29.

In another case the pericardium adhered at no part, but was every where covered, both on its free and reflected surface, with curd-like lymph, which was accumulated in the largest quantity over the auricles, and on the basis. The adventitious membrane being turned back, discovered red spots beneath of extravasated blood like petechiæ. The quantity of fluid in the pericardium was very small, not exceeding two or three drachms. It was like whey. The endocardium showed the effects of inflammation on both sides of the heart. The tricuspid valve had minute pearl-like bodies deposited near its free edges. The mitral valve had bodies of the same kind in the same relative situation, and around some of them there was a slight blush of red. On passing the finger from the ventricle into the aorta, a palpable obstruction was felt in the situation of the valve. This was found to arise from a single fibrinous deposit upon one of the valvular processes. It was of an irregular form, and one-third of an inch in size at its greatest diameter. All the three processes were slightly thickened, and of a pinkish colour, but upon one only was there any morbid deposit. The general bulk of the heart and the capacity of its cavities were natural, and its muscular substance was apparently healthy.

Here the exocardial and endocardial murmurs continued, until the symptoms of dissolution arose. For four days before eath, the heart could hardly be heard or felt, and all distinc-ion of sound was necessarily lost.—M. 25. 69.

In the third case the pericardium was only partially dherent by round loose bands of lymph, and its surfaces, here they were free were covered by a continuous layer of ymph, half an inch thick, and studded with rough, unequal, illous prominences. The pericardium contained about three unces of whey-like fluid. The endocardium bore marks of nflammation only on one side of the heart. The mitral valve ad a rough fringe of minute deposits near the edges of its free order, and each process of the aortic valve had a fringe of the ame kind, only thicker. The muscular substance was perfectly ealthy. The whole organ seemed rather large; but it could ardly be said that any part of its substance exceeded its atural bulk, or any one of its cavities their natural capacity.

Here the exocardial and endocardial murmurs continued ntil the death of the patient.—M. 31. 140.

In contemplating endocarditis and pericarditis united in the ame subjects, do we find ground for believing that either aturally tends to produce the other? In 4 of the 11 cases he endocardial was prior to the exocardial murmur; and in 4 he exocardial was prior to the endocardial. In 1 case they rose simultaneously after the patient's admission into the ospital, and in 2 they were found already co-existing at the ime of admission.

Such were the results of rheumatic inflammation of the eart in the 90 cases which fell under my observation in the ourse of five years. They include the events of life and eath during the progress of the inflammation, and the condi-ions of perfect and inperfect cure in which the endocardium nd pericardium were left after its cessation. Here my bservations stopt. And, indeed, in the 17 cases of endocarditis erminating in perfect reparation, and the 3 of complex ndocarditis and pericarditis terminating in death, it embraced he entire disease. But in all the rest there were other results et to come which my observation could not reach. These are uch as are yet to emerge sooner or later in the course of future xistence. The injured valves, or the adherent pericardium, r both combined, lay their own conditions upon the continuance of a man's life, and sometimes settle beforehand the manner of his death.

Sad, indeed, but most interesting and instructive, would be the entire history of the lives and deaths of all those in whom I here witnessed the first attack of disease, which spoiled the perfect structure of the heart. Such an entire history I shall never know. I may learn a few particulars of one or two whom I may chance to meet with, and this is all I expect.

But our knowledge of chronic maladies, which last for years, is not gained in the same manner as our knowledge of acute diseases, which last for a few days or a few weeks, viz. by watching their progress from beginning to end in the same individual patients.

Our knowledge of chronic maladies is picked up piecemeal from numerous cases seen for a while, and only for a while, at different periods of their progress. One case shows us the disease at its beginning, another at a more onward stage, another at its mid period, another towards its decline, another at its end; and then joining together the facts so collected from *many* individuals, we get our notion of what the disease may be in its entire course and character, from first to last.

Thus, of chronic injuries of the valves of the heart and chronic adhesions of the pericardium, and their results, you must not expect that I can give you the same sort of account, or attest it by the same sort of experience as I have just given and attested of the acute diseases from which they sometimes spring. I have spoken of endocarditis and pericarditis, and their results in 90 cases which I had watched from first to last. From first to last, however, was in them a period of a few weeks only. But surely I cannot speak in like manner of chronic injury of the valves of the heart, and of chronic adhesions of the pericardium, and give results drawn from an observation of 90 cases from first to last. Yet have I seen ninety, and many more than ninety, individuals, who have suffered chronic valvular injury, or chronic adhesion of the pericardium. I have seen, indeed, an infinity of patients; but in each patient I have not seen the whole disease, but only a fragment of it, and generally a very small fragment. Such single cases, in their entire clinical history from first to last, occupy years;

some two or three, some five or ten, some even twenty or thirty; and of these the conditions of medical experience can only allow a partial observation. Nevertheless, such partial observations in process of time sum themselves up to a large amount of knowledge, and furnish collectively a tolerably complete clinical history of the diseases in question.

LECTURE IX.

INFLAMMATION OF THE LUNGS ACCOMPANYING ACUTE RHEUMATISM, EITHER ALONE, OR IN COMBINATION WITH ENDOCARDITIS, OR WITH PERICARDITIS, OR WITH BOTH.

WHEN our business is with a mere dead specimen of morbid anatomy, it does not signify how exclusively we view it. We may take it apart, and look at it through a microscope, and dissect and inject it and macerate it; and thus we may learn all that can be learnt about it. But when we are concerned with a living specimen of disease, if we would understand it, we must deal with it after a different manner. The living disease, while it works its own changes in the part it occupies, gives and receives influences and impressions to and from other parts, and to and from the constitution at large. Therefore, in order fully to understand it, our enquiries must be enlarged in proportion to it. They must reach as far as it reaches. They must not settle upon the one single object, but be carried into many things beyond it.

Our present subject is the heart and its diseases; and what we have now especially in hand to illustrate is the inflammation of its lining and investing membranes which accompanies acute rheumatism. But the heart is not the only vital organ liable to suffer inflammation in acute rheumatism. The lungs may suffer also; the lungs, in all the several structures of which they are composed. And the diseases which result are bronchitis, pneumonia, pleurisy.

Knowing, then, the relative dependency of function between the two organs, and finding both ready to suffer alike from the same pre-existing or co-existing disease of the constitution, however our present business may be professedly with the one, we must not refuse to let in whatever light may be reflected upon it from the other.

It is not possible to make too much of those diseases of the heart which arise out of rheumatism. But it is very possible to make too little of the diseases of the lungs which acknowledge the same origin. The truth is, we have done so. The very habit of dwelling long and minutely (as we needs must if we would understand them) upon the facts which concern the pathology of the one organ has brought us unconsciously to regard it as a single centre of disease much more than it really is. It is well to be aware of so natural a bias towards error, and carefully to guard against it. Let each fact be made to carry with it the full force of its own truth, and yet, in relation to other facts which are as true as itself, let it hold no higher value, place, or proportion, than nature has given it.

Inflammation of the heart is incident to acute rheumatism, and so too is inflammation of the lungs. The former is of more frequent, the latter of more rare occurrence. Of 136 cases of acute rheumatism, the heart was inflamed in 90, or in two-thirds of the whole; while the lungs were inflamed only in 24, or one in 5⅓.

But that inflammation of the lungs, notwithstanding its comparative infrequency, is a matter of no mean importance in connection with acute rheumatism, will be seen from the form and character it bore in the 24 cases.

I use inflammation of the lungs as a general expression for inflammation of any pulmonary structure, either for bronchitis, pneumonia, or pleurisy. The 24 cases in question were made up of 4 of bronchitis, 18 of pneumonia, and 2 of pleurisy.

Now a bronchitis, a pneumonia, or a pleurisy involves much or little peril according to its circumstances. But here, whichever disease occurred, it always put on a serious character, either from its mere magnitude and extent, or from its force of morbid action, or from the stage at which it ultimately arrived. In the four instances of bronchitis the affection was no mere catarrh, but an inflammation largely diffused through both lungs, producing deep oppression and dyspnœa. Of the two pleurisies, one was single and the other double. The single pleurisy produced a large effusion into one side. The double pleurisy produced a double hydrothorax. Of the 18 instances of pneumonia, in 9 the disease was of one lung, and in 9 it was of both.

Pneumonia, if it be severe and abiding, generally includes more than its name implies. How much more we can often only suspect, but not exactly tell, during the life of the patient, so entirely do the pneumonic symptoms transcend the symptoms of the concomitant disease, and in effect obscure them. Severe pneumonia will often veil a pleurisy as severe as itself. It was suspected of doing so in several of the cases in question; and, in one case, dissection at last disclosed double pneumonia with double hydrothorax.

Such forms of pulmonary inflammation are portentous ingredients in the clinical history of acute rheumatism, and give a fearful interest to it. But what if this fearful interest be further augmented by its frequent coincidence with inflammation of the heart?

Of the 136 cases of acute rheumatism which form the basis of our inquiry, inflammation of the lungs was found in 24. Here the proportion is about 1 in 5¼. But *how* were these 24 cases distributed? What proportion of them occurred where the heart was unaffected, and what proportion where the heart was inflamed? And, again, what proportion, where the inflammation was of the endocardium alone; what, where it was of the pericardium alone; and what, where it was of the endocardium and pericardium simultaneously?

Of the 46 cases of acute rheumatism in which the heart was unaffected, the lungs were inflamed in 5. Here the proportion is as one to nine. But of the 90 cases in which the heart was inflamed, the lungs were also inflamed in 19. Here the proportion is more than one in five.

The 19 instances of inflammation of the lungs were distributed among these 90 cases of inflammation of the heart in different proportions, according to the part of the organ affected.

Of the 63 cases of endocarditis the lungs were inflamed in 7. Here the proportion is as one to nine.

Of the 7 cases of pericarditis the lungs were inflamed in 4. Here the proportion is more than one-half.

Of the 11 cases of endocarditis and pericarditis simultaneously, the lungs were inflamed in 8. Here the proportion is more than two-thirds.

What can we, or what can we not, conclude from this enumeration of facts? What general truths do they declare?

We cannot conclude, from inflammation of the lungs being found in one case of acute rheumatism out of nine, that acute rheumatism has any strong natural tendency to inflame the lungs. Neither can we conclude, from its being found in one case of rheumatic endocarditis out of nine, that rheumatic endocarditis has a special natural connexion with inflammation of the lungs. The probability of inflammation of the lungs arising out of acute rheumatism is small; and the probability is not at all augmented by its alliance with endocarditis. For in acute rheumatism, inflammation of the lungs does not occur more frequently when the endocardium is inflamed, than when the heart is entirely exempt from disease.

We find it to be between inflammation of the pericardium and inflammation of the lungs, and between inflammation of the endocardium and pericardium occurring simultaneously in the same subject, and inflammation of the lungs, that frequent coincidence seems to establish a natural connexion.

That inflammation of the heart which is least perilous in itself is least liable to have its danger augmented by an union with inflammation of the lungs, viz. endocarditis; while that which is most perilous in itself is most frequently accompanied by inflammation of the lungs, adding immensely to its danger, viz. simple pericarditis, or endocarditis combined with pericarditis.

Of rheumatism without affection of the heart there were:—

Cases 46.—Lungs affected in 5.

Single pneumonia (fatal)	M.	26.	26.
Single pneumonia	M.	27.	81.
Single pneumonia	W.	21.	111.
Diffused bronchitis ending in double pneumonia	M.	30.	65.
Diffused bronchitis of both lungs	W.	24.	149.

Of rheumatism with endocarditis there were:—

Cases 63.—Lungs affected in 7.

Double pneumonia	M.	27.	227.
Double pneumonia	W.	25.	42.
Double pneumonia	W.	26.	65.
Diffused bronchitis passing into double pneumonia	W.	20.	216.
Single pneumonia	M.	27.	142.
Diffused bronchitis of both lungs	M.	24.	178.
Bronchitis passing into inflammation of the larynx and trachea	W.	21.	130.

Of rheumatism with pericarditis there were:—

Cases 7.—Lungs affected in 4.

Double pneumonia	M.	31.	121.
Diffused bronchitis passing into double pneumonia	M.	29.	60.
Single pneumonia	W.	22.	4.
Single pneumonia	W.	25.	121.

Of rheumatism with endocarditis and pericarditis combined there were:—

Cases 11.—Lungs affected in 8.

Double pleurisy with double hydrothorax .	M.	32.	166.
Single pleurisy with hydrothorax . . .	W.	25.	183.
Double pneumonia	W.	22.	110.
Double pneumonia with double pleurisy and double hydrothorax (fatal)	M.	31.	140.
Single pneumonia	M.	26.	44.
Single pneumonia	M.	30.	107.
Pneumonia and diffused bronchitis of one lung (fatal)	M.	25.	29.
Diffused bronchitis of both lungs (fatal) .	M.	25.	69.

I know not how I can give you a better notion of what these complications really are, and how they present themselves one after another to clinical observation, and the awful amount of disease that results, than by describing, with some detail, certain cases of acute rheumatism in which they existed, and commenting upon their particulars as I go along.

William Buckley, a stout well-formed man of forty years of age, was admitted into St. Bartholomew's October 27, 1836. He was suffering acute rheumatism, and complained of pain, chiefly in his right shoulder and his right wrist, which was very red and much swollen. His skin was very hot, his pulse ninety-six and hard and full, his urine scanty and high-coloured, his tongue covered with a thick moist white fur. He was thirsty, without appetite, and sleepless at night. But withal his countenance was good and quite free from anxiety: in short, it was the countenance of health. He had no internal pain whatever, and the sounds of his heart were perfectly natural.

Now this man was habitually healthy, and had never suffered acute rheumatism in his life. His present attack was from accidental exposure to cold, ten days ago, which was followed by chilliness, heat, perspiration, and pain. The pain began in his feet, passed to his ankles, and had already visited all his joints in their turn, and been accompanied with heat and swelling in all.

This case surely promised well, and I was content to treat it with ten grains of Dover's powder night and morning, and to interpose the use of active purgatives.

For three entire days, and four entire nights, his existing symptoms remained nearly the same, and no new symptoms were superadded.

On the fourth day the pain and swelling had shifted from the right wrist and shoulder to the left wrist and shoulder. And now, in applying the stethoscope to the region of the heart, a distinct exocardial murmur was heard. It was chiefly at the basis, and lost somewhat of its intensity as the instrument was moved towards the apex.

Here was unquestionable pericarditis. And let me remark that auscultation was regularly made of this man's chest day by day, and was just as much a matter of course (the case being one of acute rheumatism) as feeling his pulse, or looking at his tongue. The disease was not sought after from the patient's drawing attention to the part by any complaint of pain or unusual sensation, or palpitation. And when the disease was found, the patient, in answer to all our questioning, still declared himself quite unconscious of any thing amiss within his chest. It was the fourteenth day of the rheumatism that the pericarditis was first discovered, and it was most probably discovered as soon as it began to exist. But to proceed with the case :—

The patient being a strong man, and his pulse being now more full and hard, and his fever more fully developed, and a vital organ inflamed, was bled by venæsection to twenty ounces, and ordered three grains of calomel, and a quarter of a grain of opium, every three hours.

The next day the general symptoms being the same, and the exocardial murmur unaltered, he was bled again by venæsection to eight ounces, and four ounces more were taken by cupping from the præcordial region, and the calomel and opium were still continued.

The next day he had more power of moving his limbs, and the to and fro sound was thought to be a little less distinct.

The next day the fever continuing fully developed, and the pulse full and hard, and the murmur as distinct as ever, and the calomel having been now taken every third hour for four days and four nights, and having not yet produced the least sensible fœtor of the breath or salivation, ten ounces more of blood were taken from the arm.

And now for the four following days there was a great fluctuation of all the symptoms. The pain in the joints abated and returned, and then abated again. The pulse became less full and hard, but more frequent. He slept well one night, and ill another. The heart gave out a confusion of sounds which was indescribable. It was doubtful whether salivation was not coming on. Accordingly, for these four days, all active treatment was suspended, while the course and tendency of the symptoms were carefully watched.

The four days ended, it was evident that a new disease had arisen, and been added to that which already existed. The endocardium was inflamed, as well as the pericardium. It was the rise of the auscultatory signs proper to the new disease that had produced the confusion of sounds. But now the sound of endocarditis was more evident than that of pericarditis. The single systolic bellows-murmur was very distinct, while the to and fro sound had degenerated into a mere crumpling. Probably the pericardium was beginning to adhere.

The general state of the patient betokened great debility and distress of the nervous system. The pulse was 120, and small and soft. But this remarkable circumstance deserves to be especially noticed, that although the pericarditis had been going on ten days, and endocarditis was now superadded to it, the patient had not been all along, and was not even now, conscious of the least pain in the region of the heart. The first symptom directly referrible to the heart within his own consciousness, had arisen during the last two days. This was a palpitation whenever he turned quickly round in bed.

And now the treatment was resumed by the application of eight leeches to the præcordial region, and the same dose of calomel and opium at the same intervals as before; for the suspicion of salivation was fallacious.

During the five following days, the symptoms continued to fluctuate more and more. The constitutional sympathy was transferred more and more from the vascular system to the nervous system. The to and fro sound entirely ceased, and the single systolic bellows-murmur alone remained.

And now it was evident that another new disease had arisen. At the lower part of the left lung a minute crackling had taken place of the respiratory murmur, which too surely denoted pneumonia.

Again, suspected ptyalism admonished us to suspend the use of calomel; and again it was resumed, when no ptyalism was apparent. Still there was no præcordial pain. But still the pain and the swelling returned, and receded capriciously to and from the knees and the wrists.

In three days more the symptoms were all concentred in the nervous system, and all the treatment consisted in the administration of opium and ammonia. The pulse was very frequent and very feeble; the tongue trembled; the hands trembled; there were frequent perspirations; there was neither endocardial nor exocardial murmur, or any other definite sounds of an unnatural kind proceeding from the heart. Probably it could not contract with force enough to produce them. There was a mere roughness accompanying its systole.

Still life continued seven days longer. In the meantime the pulse rose to 140, and became more and more feeble; the perspirations were more profuse, and almost continual; the tremblings of the limbs never ceased, and at length became convulsive spasms. His mind wandered all day, except when, his attention being strongly roused, he was brought for a short time to himself. At night he was sleepless, singing, or muttering, or vociferous. Opium, however, procured him sleep during one entire night. He woke refreshed, was rational for a short time, confessed he was free from pain, and then relapsed into delirium. His evacuations passed involuntarily. As his sweats became more copious, his tongue became drier.

At length he seemed made quiet by exhaustion. His last two nights were very tranquil. On the 26th of November he died. It was the fortieth day from the commencement of the rheumatism, the twenty-sixth day from the commencement of the pericarditis, the eighteenth or nineteenth from the commencement of the endocarditis, and the fifteenth or sixteenth from the commencement of the pneumonia.

The exocardial murmur was distinctly audible only seven days, and in nine days it was entirely gone. Hence we inferred that the pericardium was adherent to the heart. The endocardial murmur ceased as such in eight days, from the heart having not force of contraction enough to produce it, and so it degenerated into a mere roughness. The crepitation, which denoted the lungs to be inflamed, being once heard at the back, was never afterwards sought after; for it would have been at peril of the patient's life to have raised him in bed, his debility had become so great.

There is an omission of one important circumstance in the record of this case. I find no notice of any dulness to percussion in the præcordial region. In truth, I was not at that time (1836) fully aware of the important intimations derived from percussion in pericarditis.

Now, why was not this man cured? When he came into the hospital his complaint was simply rheumatism, and each of its perilous adjuncts arose one by one under our observation, and was treated vigorously and without delay. The man's constitution, too, was good, and capable of bearing well the remedies needed to arrest the progress of inflammation. Yet he died. Did he die because the *great* remedy failed of its specific effect,—because the mercury failed to salivate? The appearances on dissection appertaining to the heart will be found elsewhere.* The following was the state of the lungs. Both of them were slightly emphysematous, and neither of them collapsed upon removal of the sternum. The right was crepitous throughout, and loaded throughout with frothy sanguineous fluid; and the surface of every bronchus, as far as it could be traced, was loaded with blood. Every portion of this lung was buoyant in water. Of the left lung the entire lower lobe was hepatised, and sank in water while the upper lobe presented the same pathological conditions as the other lung.

To me this case, as it passed under my observation, was full of interest and instruction, and of painful disappointment. (M. V. 25, p. 29.)

Catherine Sullivan, aged 22, married, a picture of abject want and wretchedness, was admitted into St. Bartholomew's, May 4, 1837. Her skin was hot and perspiring, her pulse 120, and full, but without power, and occasionally faltering in its beats. All her large joints swelled and painful; her breathing now quick and hurried, now pausing and sighing. She complained, moreover, of pain in the præcordial region, and palpitation. She coughed often, but did not expectorate, and in coughing she increased the pain at her heart.

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* Vide p. 92.

Auscultation found the exocardial murmur most distinct at the basis of the heart, and extending thence to the cartilage of the fifth rib. It found, also, the systolic endocardial murmur, which was, also, loudest at the basis, and gradually became less loud towards the apex.

Such was her actual state. And this was her history. She had lived in vice and misery, and want. Ten days ago she had begun to suffer pain and swelling of the joints with fever. From the first she had been sensible of indefinite pain and uneasiness of the chest, which two days ago, by gradual increase, had reached their present form and aggravation.

It is hardly possible to conceive a case more unpromising than this. Here were the worst diseases in the worst constitution. They had been in progress probably for more than a week. They had probably reached their extremity two days. The pericarditis and endocarditis and the rheumatism had been hitherto untreated by any remedy. All still remained to be done that could be done.

She was at once cupped to ten ounces between the left scapula and spinal column, and ordered to take two grains of calomel and a quarter of a grain of opium every three hours.

The next day she was found to have passed a quiet night, though without sleep. But her pulse had risen to 140, and was certainly feebler. The præcordial pain had increased, and the palpitation and dyspnœa were undiminished. The same sounds were heard in the region of the heart. She had had three or four bilious motions.

Thus the change since yesterday was surely for the worse. The greater weakness and greater frequency of the pulse denoted that a collapse of the nervous system was at hand. But one symptom there was, which, among all others that were bad, still furnished me a ground of hope. The tongue was covered with a white fur, and was *very moist.* This seemed to promise a speedy salivation.

She was again cupped between the left scapula and the vertebral column to ten ounces, and the calomel and opium were continued as before.

The next day, the endocardial and the exocardial murmurs being the same, and the pulse being just as feeble and frequent (140) as it was, the cough, and palpitation, and præcordial pain, and pain in the joints were all diminished. The gums were slightly sore.

On the next day the pulse and all the general and local symptoms were the same, while the salivation was on the increase. But on the next the countenance manifestly less anxious, and the pulse reduced for the first time to 120, bespoke some favourable change in the essential conditions of the disease, although the auscultatory signs were yet unaltered. But it was deemed right still to give the calomel and opium every four hours, for the salivation was not yet profuse.

It was now the 8th of May, the fourth day since the patient's admission. There was a remission of all those symptoms which denote progressive disease, and an apparent possibility of saving her life. This remission, however, only lasted two days. For on the 10th of May the pulse again rose to 140; the dyspnœa returned with pain in every part of the chest, as much on one side as the other, and before as behind. Auscultation found large and small crepitation diffused through both lungs. There was double bronchitis and double pneumonia. The weakness was now so extreme, that no form of bleeding could be thought of. A large blister was applied to the [illegible], and the calomel and opium continued.

The next day the dyspnœa had become an indescribable [illegible] struggle for breath. On the next the same dis[illegible] round the right side of the [illegible] percussion and no air entering into any [illegible] small space opposite the [illegible] bronchial respira[illegible] pectoriloquy. [illegible] suddenly filled with [illegible] every[illegible] the endocardial [illegible] exocardial murmur [illegible]

[illegible] following days

Salivation had run on to an excessive degree, and produced its worst distress. The fauces swelled, the tongue became too large for the mouth, and a stream of saliva was continually running from it. None but the erect posture could be borne night or day. The respirations were never less than 50 in a minute, or the pulse than 135. She was speechless, and when inquiry was made of her pains, she pointed to the epigastrium and right hypochondrium as their seat.

In this state of things there was no room for further treatment. One great remedy, the mercury, though it was no longer given, was still in constant and unrestrained operation. In truth neither food nor medicine could be administered during these four days. Neither was it possible to make any effectual examination of the chest from fear of killing her if we disturbed the only posture in which she could breathe.

On the 15th of May, being still alive, a large blister was applied to the seat of pain, which she indicated in the epigastrium. On the 16th she gave signs that her pain was relieved; her pulse had fallen to 120; her countenance had lost some of its distress; the breathing was less difficult, and she could lie on her back.

The next three days and nights were a period of comfort. No pain was felt. The respiration was easy and much less frequent, and there was hardly any cough. The pulse had come down to 120. The salivation and all its attendant distresses were greatly lessened. Yet there remained still some pain in the limbs. The endocardial murmur again accompanied the systole of the heart, but the to and fro sound had entirely ceased. I could not bring myself to disturb her tranquillity by raising her in bed for the purpose of learning, by auscultation, the state of the lungs.

Now there was a fair hope that the work of reparation had begun, and that it would proceed without further interruption; but on the 19th it was found that such pain in the chest and dyspnœa had come on during the night as to prevent her lying or sleeping. She was still in the erect posture, and the pain and dyspnœa continued, and the pulse had run up to 140. The whole of the right side was absolutely dull everywhere as it was when the last auscultation was made. I ventured to draw a few ounces of blood by cupping glasses applied to the back below the right scapula; and ordered two grains of calomel and a quarter of a grain of opium to be taken that night and the next morning.

The next day the dyspnœa was greatly diminished, and the pain within the chest was entirely gone. From this time convalescence proceeded slowly, but uninterruptedly. On the 30th the left lung had altogether recovered its healthy condition, and a feeble respiratory murmur was heard in every part of the right.

The patient remained in the hospital several weeks longer, gradually recovering all the general conditions of health. She left the hospital with the right lung restored almost to an equal capacity of breathing with the left, and the endocardial murmur still accompanying the systole of the heart, and the exocardial murmur gone. (W. 22, p. 110.)

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under any pretext whatever.

LECTURE X.

HE TREATMENT OF ACUTE RHEUMATISM CONSIDERED, PREPARATORY TO THE TREATMENT OF ITS ACCOMPANIMENTS, ENDOCARDITIS AND PERICARDITIS.—ACUTE RHEUMATISM SUCCESSFULLY TREATED, UPON DIFFERENT AND EVEN OPPOSITE INDICATIONS, AND BY DIFFERENT AND EVEN OPPOSITE REMEDIES.—HOW THIS MAY BE WITHOUT DISPARAGEMENT OF MEDICINE AS A SCIENCE.—THE TREATMENT OF ALMOST ALL CURABLE DISEASES NARROWED TO THE CHOICE OF A FEW INDICATIONS AND A FEW REMEDIES.—WHAT THE LOWEST AND WHAT THE HIGHEST OFFICE OF THE PHYSICIAN.—THE HIGHEST ENGAGED IN THE TREATMENT OF ACUTE RHEUMATISM AND ITS INCIDENTS.—THE GROUNDWORK OF RATIONAL PRACTICE IS TO UNDERSTAND THE VALUE OF SINGLE INDICATIONS, AND THE POWER OF SINGLE REMEDIES.—TREATMENT OF ACUTE RHEUMATISM UPON INDICATIONS BELONGING SOLELY TO THE VASCULAR SYSTEM, AND SOLELY BY BLEEDING.—UPON INDICATIONS BELONGING SOLELY TO THE NERVOUS SYSTEM, AND SOLELY BY OPIUM.—UPON INDICATIONS BELONGING SOLELY TO ABDOMINAL VISCERA, AND SOLELY BY CALOMEL AND PURGATIVES.

ALL our inquiries, as far as they have gone, into the subjects of endocarditis and pericarditis may be very interesting, and all our speculations may be just and true. But however interesting, just, and true, they must not terminate here. Our patients at least have a farther concern with these diseases, and so should we—a concern, namely, how they are to be treated.

Now, endocarditis and pericarditis are the same things in essence. They are both inflammations. And endocarditis and pericarditis are annexed to the same pathological condition of the constitution at large. They both belong to acute rheumatism. Moreover, they often occur together in the same subjects. Thus the treatment of both is by the same remedies, and may be spoken of together.

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But the treatment of the general pathological condition out of which they both spring, first claims our attention. For the right or wrong management of the rheumatism may have a share in determining whether these, which for the present we must be content to call its incidents, shall or shall not take place at all. And further, if they *do* take place, what shall be their character, and what their degrees of severity.

Acute rheumatism has experienced strange things at the hands of medical men. No disease has been treated by such various and opposite methods. Venæsection has wrought its cure, and so has opium, and so has calomel, and so has colchicum, and so have drastic purgatives. I speak of these remedies in the sense which medical men imply when they talk (as they sometimes do) of this, that, or the other thing being their "sheet anchor"; meaning that they rest upon it alone for the cure of the rheumatism, and employ other remedies either not at all, or for very subordinate purposes. And, indeed, I bear my testimony to the success of each of these different remedies, so far as that, under the use of each, I have seen patients *get* well.

At the first view all this looks very strange. The cure, or seeming cure, of the same disease by different remedies, even by remedies which in their mode of operation have nothing in common, appears like luck or accident. At the first view it may shake one's faith in physic a little, and may a little excuse the pleasantry of some who choose to hint, that Nature is our best friend after all; for that, do what we will, she brings things to a prosperous issue in spite of our blind interference.

But without disparaging the part that Nature plays, I here see no fair subject of ridicule, and no fair reason for distrust of methods of rational treatment. The first maxim of all rational practice is, that Nature is supreme; the next, that Nature is obsequious. The end, whether bad or good, death or recovery, and every step and stage conducive to it, are the unquestionable work of Nature. But Nature, in all her powers and operations, allows herself to be led, directed, and controlled. And to lead, direct, or control for purposes of good, this is the business of the physician. But how to do it best, he has to exercise a choice of modes and means in every case, which, though never exempt from the possibility of error, becomes less fallible by the teaching of experience.

This choice leads, and always will lead, to diversity of practice, which in no way disparages, but rather tends to enlarge and to enrich the resources of our art.

It is not possible that the treatment of diseases shall be ever set at rest by the consent of physicians, or that fixed and uniform plans and remedies shall ever be adopted in cases bearing the same nosological name and character. At least it cannot be until each disease has its own specific antidote, or until each has disclosed some seminal principle from which it springs, and shown where it is, and what it is: some principle, too, it must be which is within reach, and which is destructible and easily destroyed.

But we know very little about the seminal principle of diseases, and that little serves to show that no sooner does it enter the body (as in the case of contagion), than it is gone at once beyond our reach. It germinates in secret. It spreads itself abroad in secret. And when, at length, it excites various organs and systems to extraordinary modes of action and suffering, then, and not sooner, begins our knowledge of a present disease, and our power of interfering with it. In truth, these modes of action and suffering are *to us the* disease. They are, moreover, our only objects of medical treatment.

In cases of fever from contagion, in cases of inflammation, which is independent of external violence—spontaneous inflammation, as it is called—much must have been going on covertly within the body before those modes of action and suffering arise, which are plainly cognisable by us, and which we can interfere with. But coming in with our knowledge and our treatment when we do, and late as we may seem to do, we are nevertheless soon enough with both to perform the proper work of physicians, and to withhold the disease from terminating in death or disorganisation. For it is by these actions and sufferings—it is by the actions and motions of blood-vessels, or by the feelings and susceptibilities of nerves, or by the special functions of particular organs, such as the stomach and bowels, the liver and kidneys, being extraordinarily exalted or extraordinarily depressed, or variously disturbed and perverted, it is by one or by several of these that diseases, of whose seminal principle we have no knowledge, declare their existence, and denote their progress and tendency; and it is by and through the same that they are brought into a capacity of treatment and of cure. The vascular system as a whole, and the nervous system as a whole, and the particular organs indicated, are in an especial manner within the reach and power of medicine. It is by remedies operating through some of them that nearly all curable diseases are in effect cured.

But our present business is only with the treatment of acute rheumatism. Yet these general remarks, introductory to it, will not, I trust, be thrown away. For the treatment of acute rheumatism, above all other diseases which can be named, is a thing to put the physician and medicine itself to the trial of what they can really do. Here are no specifics at hand. All proceeds upon rational calculations; upon the right choice of purposes to be fulfilled, and the right choice of means to fulfil them. Acute rheumatism is often such in itself and such in its appalling incidents, as to need from time to time that medicine should put forth the full compass of all its powers. Every organ or system of organs which, either directly or indirectly, can receive the impression of remedies, are from time to time called to bear all that they can possibly endure; and it is often only when the powers of medicine are pressed even to the verge of destroying life, that life is saved.

If the treatment of acute rheumatism ever come to this, it is right to know what we are about when we undertake to treat it.

It has been said that, in the treatment of acute rheumatism, one trusts entirely to venæsection and cures it, another to opium and cures it, and another to drastic purgatives and cures it. Here, among several indications which offer themselves to his choice, the physician takes a single one, and makes it the sole mark and scope of his practice, trusting that, when he has effectually attained it, the complex actions and sufferings which constitute the disease will be brought to an end.

Thus he takes the high vascular action of acute rheumatism, and sees the whole disease represented in it, and is solely intent upon subduing it by venæsection, expecting that, as he pulls down the circulation, the fever, the nervous disquietude, and the pain, and the swelling will all cease, and the various secreting organs of the body will resume their natural functions, and that thus the actions of health will gradually supersede the actions of disease. Or he takes the nervous disquietude and the pain of acute rheumatism as the representative of the entire disease, and deals with it accordingly, being solely intent upon moderating them with opium, and expecting that, as they subside, the high vascular action and the fever and the swelling will subside along with them, and that the secretions will return to their healthy measure and kind. Or he takes the state of the several secretions, their deficient quantity, and their unhealthy quality, as the representative of the entire disease, and so addresses his treatment to those organs whose secretory functions are more immediately within the reach of medicine, to the stomach and bowels and liver, and he gives large and repeated doses of calomel, and follows them with large and repeated doses of purgative medicine. This he does, and this is all that he does; and having done it effectually for a few days, and obtained very large and bilious evacuations, he expects that the fever, and high vascular action, and nervous disquietude, and pain and swelling will all cease, and the patient will be well.

Let me repeat my testimony to the success of this practice in acute rheumatism; the practice, namely, of choosing some single indication, and steadily pursuing it to its fulfilment. It is a very rational practice. It is founded upon experience, and it compasses its end by very simple means; and the manner of its successful operation may be well conceived, if it cannot be entirely explained, in the present state of our knowledge. Disease is a series of new and extraordinary actions. Each link in the series is essential to the integrity of the whole. Let one link be fairly broken, and this integrity is spoiled; and there is an end of the disease; and then the constitution is left to resume its old and accustomed actions, which are the actions of health.

But, you may ask, Is the treatment of acute rheumatism really so plain and simple an affair in all cases? Is there nothing else to be done, but out of several purposes (or indications of treatment, as we call them) to choose judiciously some single one, and pursue it resolutely and effectually by the simplest means? And is this the practice to which the cure of the disease may be safely trusted in all cases? Certainly not—certainly in a small proportion of them only.

But it is not without reason that I have dwelt upon this practice of single indications and single remedies. For, though capable of being strictly followed in a few cases only, it contains a principle of large application, which helps and furthers the treatment of all cases of this disease, and of many diseases besides.

The lowest office of medicine is to minister to mere ailments; and this is most effectually done by telling people what in their ordinary mode of living is injurious, and warning them against it. But inasmuch as injurious things are commonly very pleasant things, people are reluctant to leave them off at our mere bidding. Hence in this, which is their humblest province, small credit upon the whole has been gained by the best physicians. The advice they have to give is much too simple for the world to accept upon the credit and character of well instructed and honest men. It needs to be enforced, not by the art which they *do* practise, but by the mystery which they do *not*. For no sooner does the same recommendation of abstinence from what is injurious gain the help which it needs from the mystery of homœopathy (a mere name, importing the discovery of something unintelligible, and importing it for the popular enlightenment in Greek) than compliance becomes easy, cures multiply, fame vociferates, the glory is great, and great too is the emolument.

But the highest office of medicine is to minister to diseases, which, by themselves or by their incidents, go directly and rapidly to the destruction of life. And this is not to be done by begging people to be reasonable and abstain from what is wrong, and cheating and cajoling them into compliance. But it is a business for wise and cautious men alone to meddle with. The powers of art must be brought to overrule the operations of nature by force. To know these powers and how to wield them to such a purpose is an affair beyond all trick and all skill of practising upon the fancies of mankind. It can only proceed from a faithful and candid search after truth by each of us for himself according to his opportunities, and from a ready communication of what we believe to be the truth by all of us among one another, and from a comparison of their experiences and conclusions among the best minds.

Now the highest office of medicine, in the sense explained, is engaged in the treatment of acute rheumatism and its incidents. At every step of its treatment, principles are involved which may be transferred to the treatment of almost all diseases in which medicine plays an indispensable part. While, therefore, I proceed to tell you of the management of acute rheumatism, you must consider me as illustrating the general power of remedies by this example, and so be prepared for any general remarks I may let in as I go along.

Well, then, I am persuaded that when the physician is called upon to perform great things, even to arrest destructive disease, and to save life, his skill in wielding the implements of his art rests mainly upon the right understanding of simple and single indications, and of the remedies which have power to fulfil them. To know that, in any cases of acute rheumatism, the cure of the entire disease is accessible through the blood-vessels alone, by subduing their too forcible action; or accessible through the nervous system alone, by moderating its disquietude, and abating pain; or accessible through the stomach and bowels and liver alone, by stimulating them to a very large amount of secretions; and to know, moreover, that in any cases venæsection alone will fulfil the first purpose, or opium alone will fulfil the second, or calomel and aperients alone will fulfil the third: to know all this is the best preliminary step towards enabling us to deal safely and successfully with other and more numerous cases, which need a more complex method of treatment, and require that all these important purposes be pursued simultaneously, and all these great remedies be made confederate for the cure of the disease.

As to the first of these great remedies, and the indications for employing it, I know no disease in which febrile heat is greater, and the pulse harder, fuller, and more forcible, than in acute rheumatism. What, then, are the signals for copious blood-letting, if these are not? And together with heat so great, and the pulse so hard, so full, and so forcible, unquestionable inflammation is present in various parts of the body; and what can further demand and justify copious blood-letting, if this does not?

But let us pause and consider awhile. When inflammation is unquestionable, and when it has newly arisen, and with it fever and excess of vascular action, the amount of this fever and vascular action becomes the measure of its treatment. And it becomes so, because it is in truth the measure of the inflammation itself, *i.e.* the measure of its force, and the rate of its progress towards whatever *evil event it may tend, either according to its own nature, or according to the nature of the parts it occupies.* In most parts of the body such an amount of fever and vascular action, as usually accompanies acute rheumatism, would denote inflammation tending rapidly to its worst event —to some kind of destructive disorganisation. It would so in the brain; it would so in the lungs; it would so in the liver. Therefore, in inflammation of the brain, the lungs, or the liver, such fever and such vascular action would call for any quantity of blood-letting that might be needed to subdue them. For their abatement alone would show the inflammation abated, and its destructive progress arrested.

But in rheumatism the inflammation (I mean the external characteristic inflammation), either from its own nature, or from the structures it occupies, tends to no such destructive event. It has its primary seat (there is reason to believe) in fibrous structures, and the swellings which accompany it are produced by serous effusion, partly into neighbouring cellular texture, and partly into the synovial membranes of bursæ and joints. And in the vast majority of cases, however severe be the disease, and however long it may last, the local mischief stops with these effusions, and the structures engaged, fibrous, cellular, and serous, undergo perfect reparation, and the joints are eventually uninjured.

In acute rheumatism, therefore, the excessive heat, and the full, hard, and forcible pulse need not hurry us into a determination to bleed to any amount that may be requisite to subdue them, with the ultimate purpose of withholding the inflammation from a destructive event. But the aim and intention of the remedy are rather respective to the disease *as a whole*, than to the inflammation attending it. It would be otherwise if the liver, the lungs, or the brain were inflamed, and not the joints.

With respect to the disease as a whole, then, let us consider the uses of this remedy.

I have seen people enormously bled in acute rheumatism, and their entire disease swept away at once, and health restored rapidly. And the practice which will do this, is it not a splendid and a tempting practice?

Again; I have seen people enormously bled in acute rheumatism, and their disease swept away at once; but they have forthwith gone raving mad. And a practice which will do this, is it not a hazardous practice?

And again; I have seen people enormously bled in acute rheumatism, and no single pain has been mitigated; but the disease has continued for an unusually long time in its acute, and then has degenerated into its chronic, form. And a practice that has this issue, is it not a doubtful practice?

These facts are instructive. They warn us to beware of large bleeding in acute rheumatism. Yet the immediate indications for it *now*, when it would (I believe) be erroneously prescribed, are the same upon which it would be entirely justifiable in some other diseases, viz. the extreme heat and the extreme fulness and hardness of the pulse. But then in those other diseases, all hazards sink into insignificance compared with the hazard of progressive inflammation in a vital organ. Large bloodletting, however, has hazards of its own great enough not to be incurred except in exchange for those which are far greater.

Now, one chief hazard of large bleeding is from the shock it is apt to communicate to the nervous system; and it is this which we should especially seek to avoid, when we employ venæsection in acute rheumatism. Venæsection is often needed; needed for what no other remedy can perform towards the cure, and therefore not to be omitted. It is needed especially to abate high vascular action. But no such thing must be thought of as bleeding and bleeding, until the large pulse becomes small, and the hard pulse soft. For, to bring about this, blood must be let flow to a terrific amount. Fulness and hardness of pulse are indeed express characteristics of acute rheumatism, rising to superlative degrees, and enduring pertinaciously, and resisting stubbornly the power of remedies to pull them down. To abolish them at once or speedily in the severer cases, is hardly possible by any counteracting means which medicine can safely employ. They are above a match for them all, and they *will* endure their time. They are above a match even for venæsection, unless it be pushed with a desperate hand, careless and reckless of new dangers to life.

Upon the whole, then, the practice which proposes to compass the cure of acute rheumatism at whatever cost of blood may be needed to fulfil the indication of absolutely subduing the force of vascular action, is a very uncertain and a very dangerous practice, although success has undeniably attended it in some instances.

Still venæsection is among the remedies of acute rheumatism, not needful in all cases, but expedient in many. It is expedient to abate vascular action when it is excessive, and when the patient is robust and young, and the disease has arisen accidentally in a healthy constitution. And these, indeed, are its most common conditions. Acute rheumatism is most frequently found in the young, the robust, and the previously healthy. But however the severity of the disease, and the age and constitution of the subject, may invite the remedy, this caution especially must be observed in its use; take care that in abating vascular action by venæsection, you do not communicate a shock to the nervous system. If you do, you are likely to disturb the just tenor of the disease, and then some untoward circumstance, which is quite foreign to it, may arise, and some of its worst events may ensue.

But in the young, the robust, and the previously healthy, where vascular action is not excessive, and in the old, the feeble, and previously valetudinary, even where it is, venæsection is best omitted. There are other remedies, which, without the help of venæsection, may be trusted for its safe and effectual cure.

Summarily then I would venture to say of venæsection, employed under the most suitable conditions, and in the most suitable measure, that it is to be trusted, rather as preparatory and auxiliary to other remedies, than for its own exclusive remedial power in acute rheumatism. It very often renders the disease more curable by other means; but it seldom cures the disease itself.

But it has been said that the cure of acute rheumatism is accessible through the nervous system alone, and by means of opium.

No disease can be mentioned of which pain is a more prominent and abiding characteristic; hardly any in which it is more severe and more extensive, and occupies more situations at a time. It is, moreover, the sort of pain which rouses and excites, and however long it may continue, even for several weeks perhaps, it still rouses and excites to the last.

This is a circumstance which deserves our notice. The pain which is annexed to inflammation of internal and vital organs, however it may at first rouse and excite, soon begins to depress, then to exhaust, and then to overwhelm; and as the disease proceeds, and as the vital powers fail, the nervous system sinks into an absolute incapacity of feeling pain at all. But the pain which belongs to the inflammation of external parts and parts not vital, continues much longer to rouse and to excite, because life itself, or the springs of life, continue much longer unassailed. Thus, in acute rheumatism, the nervous system and the vascular system, the great sources of action and feeling, being unharmed, feel and resent the disease purely as a stimulus. As long as the inflammation is of the fibrous, cellular, and serous structures in the neighbourhood of joints, and of them only, the brain and the nerves, the heart and the blood-vessels, and all that *feels* and all that *acts* within the body, have their susceptibilities and their movements raised, quickened, and invigorated. All within the man is (as it were) doubly alive; and every thing that hurts is doubly felt, and doubly resented.

If, then, such be the pain, and such the long and undiminished capacity of suffering in acute rheumatism, well might physicians, in their treatment of it, look to such remedies as abate pain, and exercise a sedative influence upon the nervous system. They have, indeed, looked especially to opium. And opium, prescribed with these intentions, has encountered the disease singlehanded and successfully. But *how* prescribed, and in *what* measure?

A grain of opium given to a man in health and at ease, would continue to be felt for twenty-four hours; not so when it is given to a man in constant and severe pain. The same quantity would now be felt little or not at all, or for a much shorter time.

The nervous system may become wild with suffering, and then it is not to be soothed and coaxed into quietude, but to be subdued. It is with the nervous system exasperated by physical, as it is with the mind exasperated by moral, pain. The maniac cannot be pacified by persuasion; he must be held down by some power which he cannot resist; and even then he is not absolutely still. The victim of cancerous disease must be overpowered and stupified with opium, and even then he is not altogether insensible to his pain.

The pain of acute rheumatism will hardly bear to be compared with that of cancer. But it is a very sharp and constant pain, and severely aggravated by the least movement and the least touch. The dose of opium must be large, and pretty often repeated, which is to reach it and lessen it. In the severer cases, and when the whole treatment of the disease is left to the sole remedial power of opium, the measure and frequency of its dose must be enough to *subdue*, if it is to have a fair chance of tranquillising.

When first, and for a few years after, I became physician to an hospital, opium was my remedy in all cases of acute rheumatism, excepting such as presented some special circumstance to forbid its use, or to require a different treatment. My single purpose was to abate pain, and to quiet the nervous system. The dose I employed varied from two grains to five or six in twenty-four hours. I began with one grain every twelve hours. Then, as the patient seemed to bear it or to need it, I gave a grain every eight hours, then every six, and then as often as every four. There were many cases for which a grain every twelve hours, or two grains in the twenty-four, were quite enough. And there were few for which a grain every four hours, or as much as six grains in the twenty-four, were needed. The majority, however, required a grain every eight or every six hours, or three or four grains in the twenty-four. In the mean time, while I thus employed opium *immediately* to abate pain and quiet the nervous system, and *ultimately* to cure the disease, I had no other care except to keep the bowels from being bound, but not to purge them.

And now, perhaps, you may be disposed to suspect, after all, that this practice had nothing positively remedial in it; that the progress and duration of the disease were in nowise affected by it; and that only its pains were thus rendered more tolerable, while it wore itself out by a spontaneous and unassisted reparation.

But I am very far from thinking so. It is true that I cannot produce a certain number of cases treated by no remedy at all, and compare them in their results with a certain number of cases treated by opium. I do not know that I ever saw a case of acute rheumatism left entirely to itself. But I have seen many cases, if not altogether abandoned to nature, very little assisted by art. When I was a student, acute rheumatism in the hospitals of London was commonly treated thus:—A dose of liq. ammoniæ acetatis was given thrice in the twenty-four hours, and a moderate opiate at night. Such treatment cannot be called nugatory, or tantamount to no treatment at all. It might even, where pain and vascular action were small, have been quite treatment enough, and have justly had the credit of the cure. But in the majority of cases it could have done very little. In the majority there was more of action and suffering than it could have power to counteract. The means themselves had no unsuitableness to their end; but there was a shortcoming in the way of using them. The means had plenty of remedial force in store; but that force was not brought out, as it might have been, by the time and measure of their application, and so made more a match for the force of the disease, and more available for its cure. Accordingly, by this treatment (to speak of its results as favourably as possible), the acute rheumatism was seldom brought to a close in less than six weeks. It took full six weeks, upon an average, to get the patient out of bed and fairly upon his legs again. And then he had still his strength to regain that he might be fit for work. Whereas, under the treatment by opium (given not merely in a moderate dose and at night only with the hope of procuring sleep, but at more frequent intervals and in quantity proportionate to the amount of pain and nervous disquietude it had to subdue or to mitigate) the disease has commonly ended, and convalescence has fairly begun in half the time.

Such, then, is my experience of the curative impression, which may be conveyed to the entire disease solely through the nervous system, and solely by means of opium. And let me add that, considering what acute rheumatism is in the majority of cases, and what it needs, and what it will bear, I regard the indication found in the nervous system to be upon the whole a safer and better guide for its treatment than that found in the vascular, and opium upon the whole to be a safer and better remedy than venæsection; if we are to follow one of the two indications, and to use one of the two remedies only.

But recollect, I am not recommending that acute rheumatism be treated exclusively, either according to the one or the other of these indications; or exclusively, either by the one or the other of these remedies. I am only now showing the value of each indication, and the power of each remedy separately, in order that you may better understand and appreciate other more complex methods of treatment in which both indications are followed, and both remedies are employed concurrently.

The third plan remains to be considered, which, passing by the vascular system and the nervous system and all indications of treatment to be found in either, fixes upon the liver and the abdominal viscera, and seeks to compass the cure of the entire disease by remedies addressed solely to them.

The immediate object of this practice is to obtain from these organs a vast augmentation in the amount of fluids which they secrete, and to evacuate it outwards. The mode of proceeding is this. Ten grains of calomel are given at night, and a draught of salts and senna on the following morning; and the same are repeated night and morning as long as they are well borne, and continue to produce the effect desired.

The evidence of their being well borne is, that they occasion little or no distress in their operations; and the effect desired is, that they bring away abundance of a dark or deep-coloured bilious colluvies from the bowels. As long as such are the feelings of the patient under their operation, and such their effects, the medicines may still be given, and still are needed.

The evidence of their being ill borne is that they occasion tormina and tenesmus, and scalding of the rectum; and their effect not to be desired is, that they bring away pure bile, or transparent mucus or blood. When such begin to be the patient's feelings, and such the products of the medicines, this plan of proceeding must be immediately given up.

Now, it is for three or four nights and mornings consecutively that this dose of calomel and this purgative draught will be well borne in the majority of cases; and the better they are borne, the more likely they are to do good.

But the dose of calomel need not be exactly ten grains, neither more or less. Finding ten do too little, the next night I have given twenty. Finding ten do too much, the next night I have given five: only I would remark, that the dose of calomel must be a considerable dose. If your patient will not bear five grains, this method of treatment is not for *him*, and the sooner you back out of it the better.

When the full dose of calomel and the purgative draught have been given for three or four successive nights and successive mornings, and have been well borne, and have had the effect which we desire upon the liver and the abdominal viscera, it sometimes happens that the same remedies are thenceforth no longer needed, and can no longer be borne in any dose. They have well fulfilled their immediate purpose, and done all they can do for the ultimate cure. But sometimes they are both needed, and can be borne a little longer, yet in a smaller dose. A grain or two of calomel at night and a moderate aperient in the morning still continue to be required for procuring daily evacuations.

As this plan of treatment works prosperously day after day in its immediate effects, so day after day it gives an earnest of the remedial impression it is exercising upon the whole disease. It abates the fever, it softens the pulse, it reduces the swelling, and it lessens the pain. In short, it subdues the vascular system like a bleeding, and pacifies the nervous system like an opiate; and often in the course of a week the acute rheumatism is gone. In three days there is often a signal mitigation of all the symptoms; and in a week I have often seen patients, who have been carried helpless into the hospital, and shrieking at the least jar or touch or movement of their limbs, risen from their beds, and walking about the ward quite free from pain.*

Of this plan, often so striking in its operation, and often so satisfactory in its results, I have some further remarks to make. It is called the purgative plan; yet its purpose is achieved by calomel and purgatives conjointly. The purgatives would not answer the end without the calomel; of that I am quite certain: neither would the calomel answer without the purgatives, unless it produced of itself ample evacuations from the bowels. It is probable, in short, that the remedial efficacy of the plan resides essentially in the calomel: in calomel, however, not as *mercury*, but as itself—*calomel*. If the specific effect of mercury—salivation—arise, it is not only beside our purpose, and against our wish, but it begets a serious hindrance to the use of calomel in sufficient quantity for the end in view. Thus the whole plan is frustrated. Having begun one plan of treatment, we are obliged to take up with another. Time is lost, the case is perplexed, the disease is prolonged, and the patient perhaps injured.

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* The profession owes this practice to Dr. Chambers. Its power and efficacy are displayed in numerous diseases besides rheumatism, and in their most perilous emergencies.

This is an accident liable to attend the present plan of treatment. It *will* take place sometimes. It is quite unavoidable. Men bear no mark that I know of denoting their great or their small susceptibility to mercury. Of this we must take our chance, knowing that, be the natural susceptibility what it may, fevers and inflammations seem counteractive of it to the extent sometimes of holding it in check, sometimes of suppressing it, and sometimes of abolishing it altogether.

The curative effect of calomel then being annexed to its operation upon the abdominal viscera, we should seek by all means in our power to determine it thither. For this purpose let it neither dwell too long within the bowels, nor be too soon hurried through them. Ten grains of calomel being given, should be left ten hours to do its own work alone and undisturbed. Its proper work is to impart a peculiar stimulus to the liver and the intestinal canal, and so to promote a large flow of bile and various secreted fluids into the bowels. Time is required for all this; and the purgative should be delayed until the excrementitious matter is first formed and accumulated, and ready to be brought away.

Now, if in the treatment of acute rheumatism you were to choose one indication and abide by it, and were to trust to one class of remedies, and to it only, you would find more cases that admit of a readier cure by the method now described, than by either of the two former. You would find the aggregate of morbid actions and sufferings, which constitute the disease, more surely reached and counteracted, and more quickly abolished by medicines operating upon the abdominal viscera only, than by those which influence either the blood-vessels only, or the nerves only. You would find in calomel and purgatives a better remedy than either venæsection or in opium.

There might be occasions and circumstances when the blood-vessels or the nerves would offer the best channels, and venæsection or opium would offer the best means of cure. But the occasions and circumstances presenting themselves would rather lead you to attempt the cure through the abdominal viscera, and by calomel and purgatives.

Another word upon this plan of treatment, and I have done. It has appeared to me not only to bring this disease to a conclusion in a shorter time, but to prepare the way for a more rapid convalescence than the other methods.

When the cure of such a disease as acute rheumatism is largely promoted, or altogether achieved, by calomel and aperients, it will (I rather think) often turn out upon enquiry, that the patients prior to their attack were in a state of health which needed, or would have been none the worse for, a good purging. Many and many a man have I known, who, having suffered fever of high vascular action, and been successfully treated by remedies addressed day after day exclusively to the bowels, has recovered rapidly, and thenceforth has enjoyed better health than he had known for years before. Now, is this the *critical* event of the fever, or is it the effect of the remedy? I believe the latter. I believe that his fever, severe and perilous as it might be while it lasted, was to *him* after all a happy event; inasmuch as he gained by it that medical discipline which he most needed, and which, but for it, he would not have had the benefit of.

Seeing then that by the use of calomel and purgatives in the manner described, patients have so soon thrown off their disease, and have so soon resumed the conditions of health, do I therefore finally recommend this last method as the common anchor of your treatment in acute rheumatism, and allow a place for either of the other two only when exceptions call for them? Assuredly not! The best single method, or the best single remedy, is not so good but that it may be made better by the help of other methods and other remedies.

It is true that I have seen the bleeding plan, the opiate plan, and the purgative plan each used alone. I have myself used each alone, and the two latter largely; and I have told you what, according to my belief, is their value absolutely and comparatively.

But there is a plan of treating acute rheumatism which is juster and safer, and applicable to more cases, and more successful than any of them. And that plan is a compound of all three.

This compound method, while it works with all the means which have been recommended, stops short of what is harsh and excessive in their use, and yet compasses with more certainty the successful result.

For I believe, that in the treatment of this disease, and in the same cases, by the judicious use of opium you may spare blood, and by the judicious use of bleeding you may spare opium; that by calomel and purgatives properly administered, you may make bleeding and opium less needful, and that by bleeding and opium discreetly employed you may have less to be effected by calomel and purgatives.

Hitherto you have seen how, in the management of acute rheumatism, you may deal with bloodvessels, and with nerves, and with secreting organs separately, and with what effect. Presently you will see how and with what effect you may deal with them simultaneously; and how your different remedies once set a-foot, and pursuing different paths, meet and end in one purpose,—and that purpose the cure.

"As many arrows, loosed several ways,
Fly to one mark."

LECTURE XI.

REATMENT OF ACUTE RHEUMATISM CONTINUED.—ITS TREATMENT ACCORDING TO MIXED INDICATIONS, AND BY MIXED REMEDIES. —THE BLOOD VESSELS, THE NERVES, AND THE ABDOMINAL VISCERA, BROUGHT SIMULTANEOUSLY UNDER THE REMEDIAL IMPRESSIONS OF BLEEDING, AND OPIUM, AND PURGATIVES.—ADVANTAGES OF THIS TREATMENT.—OBSERVATIONS ON THE USE OF COLCHICUM.—REPRESENTATIONS OF MEDICAL TREATMENT OFTEN FALLACIOUS FROM BEING TOO FAVOURABLE.—COMMONLY DRAWN FROM GOOD CASES ONLY; NOT FROM ALL CASES, GOOD AND BAD.—THE GOOD CASES OF ACUTE RHEUMATISM, OR THOSE FAVOURABLE FOR MEDICAL TREATMENT.—THE BAD CASES, OR THOSE UNFAVOURABLE FOR MEDICAL TREATMENT.—NOTICES OF CASES IN WHICH TREATMENT SUCCEEDS OR FAILS, CONTRARY TO EXPECTATION.—NOTICE OF MEDICINES, WHOSE OPERATION IN THIS DISEASE IS UNQUESTIONABLY REMEDIAL, YET NOT UNDERSTOOD.

THE vascular system, the nervous system, and the abdominal viscera are the channels through which, and venæsection, opium, and calomel with purgatives, are the means by which, acute rheumatism is treated and cured. Treated and cured, it may be, through any one of these channels, and by any one of these means, singly. But it may be *through* more than one of these channels, and *by* more than one of these means, conjointly. Or it may be *through* all of them, and *by* all of them, together.

The practice which chooses and follows a single indication, and chooses and trusts to a single remedy, is indeed a plain and intelligible, but a harsh and subduing, practice. In cases of ordinary severity, if the entire disease is to be effectually reached and counteracted through the bloodvessels alone, a single venæsection of large amount would be needed, or a venæsection of smaller amount once or twice repeated. If through the nerves alone, four or five grains of opium would be needed in each twenty-four hours. If through the abdominal viscera alone, a large dose of calomel and a draught of senna and salts would be required night and morning for three or four successive days.

Here is much violence done and felt as the price of success. Venæsection, single-handed, to do its work successfully, must strike with the violence that shocks, opium with the violence that oppresses, calomel and purgatives with the violence that hurts and irritates. It cannot be otherwise. If one remedy is to do all, it must be heavily charged and resolutely driven home to its purpose.

But each remedy may be charged with less force, if one be made auxiliary to the other. Bloodvessels, and nerves, and abdominal viscera may be severally spared the shock, the oppression and the pain, if they are subjected simultaneously to their several remedies. Thus, in cases of ordinary severity, a single moderate venæsection instead of several, or instead of one of large amount; two grains of opium distributed over twenty-four hours instead of four or five grains; moderate doses of calomel followed by purgatives instead of very large doses given and repeated for three or four successive nights and mornings, comprise a treatment powerful enough, and always safe, and generally successful, and not painfully felt. Perhaps it would come pretty near the truth to say, that two-thirds less of blood-letting, two-thirds less of opium, two-thirds less of calomel and purgatives, are needed when they are all made confederate for the cure of acute rheumatism, than when any one of them is employed alone.

In several cases, however, the proportion of the remedies to each other would vary. Sometimes more, sometimes less, blood-letting would be called for, and often none at all. So, too, more or less opium, and more or less of calomel and aperients.

I have remarked of the effect of blood-letting in acute rheumatism, that it belongs to it rather to render the disease more curable by other remedies than to cure it itself. Blood-letting, therefore, properly takes the lead of other remedies in point of time. For if it be necessary, the whole treatment must tarry, and other remedies come short of the good of which they are capable, until it is performed. On the first view, then, of the patient, the immediate question is—Should he be bled? and if so, to what amount? This question it would be foolish and dangerous to pretend to settle any where but in the wards of the hospital, and with the very patient before you, and your finger upon his pulse. Well, and what then? Why! then, if you judge that there is more force of circulation than calomel and purgatives operating upon the bowels, aided by the soothing effects of opium upon the nervous system, will be able to abate, you may bleed.

This is the best direction I can give. But, be it the best and wisest that can be given, it must be utterly useless nevertheless, except to those who are or shall be constantly busied about the sick. For by this direction, whether to bleed or not to bleed is made to wait upon a judgment which must be formed upon two points. And these two points nothing but the most constant bedside experience can make sure of. They are these—the exact force of the circulation, in a particular instance, to be ascertained by the pulse; and the probable power of calomel, and purgatives, and opium to reduce it, to be estimated by the ordinary effects of the same remedies.

I do not wish to exaggerate the difficulties of medical practice; neither do I wish to conceal them. I am sure you will never surmount them, unless you first feel and acknowledge them. And some practical experience is needed even for this.

When from the pulse I have considered venæsection necessary to bring down the circulation, the loss of between twelve and sixteen ounces of blood has generally been enough to answer the purpose in view; and the venæsection has seldom been repeated.

The opium, and calomel, and purgatives I have been accustomed to give in combination thus:—With the calomel administered at night, according to its quantity, I have united more or less of opium. To ten grains of calomel I have added one grain of opium; or to five of calomel I have added half a grain, continuing to give them together in the same proportions, night after night, as long as they are needed. Then, on each succeeding day, when a large purgation of the bowels has been duly obtained, I have still given the opium alone, or with saline draughts, in doses of half or one-third of a grain, every five or six hours. And thus, with the larger quantity at night, and the smaller quantities during the day, about two grains of opium have been commonly taken in the course of twenty-four hours.

Here, then, the vascular system, and the nervous system, and the abdominal viscera are all at the same time made to feel sensibly the impression of the remedy, but none of them is subdued by it. And while blood-letting, and opium, and calomel with purgatives are all made confederate for the cure of the disease, none of them is given in excess.

Now, I do not pretend to say, that this is just the measure, and just the relative proportion in which these several remedies need always to be employed for the cure of acute rheumatism. There are circumstances which would require them to be varied. But, apart from the patient, they cannot be represented intelligibly. As of venæsection, so of these other remedies, after the propriety of their use is already understood, the skill of using them remains to be learnt; the skill which sees when to give a little more, and when a little less, often or seldom—when to bear heavily or lightly on the blood-vessels, when heavily or lightly on the nerves—and when to obtain larger purgation of the abdominal viscera. This is the skill which cures diseases and saves lives. And no man ever had it, who did not obtain it from his own self-teaching amid the emergencies of actual practice.

There is a remedy much used, and of unquestionable benefit in the treatment of acute rheumatism, which I must not omit to mention. I have not mentioned it sooner, having not been able to find a place for it among the remedies hitherto spoken of; for its curative properties are not, like theirs, constantly annexed to any known operation upon particular organs. But a remedy may have as just a claim to our confidence from our bare experience of its doing good (that experience being sufficiently large), as from our perfect insight into its mode of operation.

Let it be observed, however, that any remedy which, working in the dark, is nevertheless trusted for its ultimate effects, requires to be administered with the greatest care. Even *because* it works in the dark, therefore, whenever we venture to give it, the conditions of the malady should always be clearly those in which it is known to do good; and further, *because* it works in the dark, therefore all the possible ways in which it may do harm should be foreseen and guarded against.

With these remarks, I will proceed to tell you what I know of the use of colchicum in acute rheumatism, for it is the remedy that I allude to.

Colchicum, single-handed, cannot (I think) be safely trusted for the cure of acute rheumatism in the severer cases, but it can in the milder ones; and I have so trusted it: yet I do not recommend the practice. Colchicum given alone has been slow, even in these milder cases, of making its curative impression. Many days have generally elapsed before it has produced any abatement of swelling and pain, of vascular action and of fever; and then, not until it has *begun to purge smartly* and *even painfully*. Now these are hardly satisfactory conditions upon which to obtain the remedial effects of colchicum. For to purge by colchicum is to make it act as it does in its first degree of poisoning.

Finding, then, that in the milder cases I had no fair chance of obtaining from it the virtue of a remedy without running some hazard of it as a poison, it was much too dangerous an experiment in my eyes to commit the treatment of acute rheumatism to it mainly or entirely in the severer cases. For now it must be pressed nearer and nearer to the verge of poisoning in order to bring it at all within the capacity of curing.

But in all cases of acute rheumatism, both mild and severe, the practice prevails of giving colchicum, not alone, but as an auxiliary to other remedies. To bleeding and opium and calomel and purgatives, given in the manner specified, many would add colchicum. They would prescribe a grain of the acetous extract, or fifteen or twenty minims of the wine twice or thrice a day, some considering it to act sedatively and as a special auxiliary to opium, and some specifically and with the force of an antidote, as it does in gout.

I, too, use colchicum in acute rheumatism, but not after this manner. I reserve it for special emergencies; and then I employ it with a trust and confidence which I have in no other remedy.

When by venæsection and by opium and calomel with purgatives, excess of vascular action, and fever and pain and swelling are abated, yet none of them are entirely abolished, but all still linger; or when pain and swelling do not subside at all in proportion to the abatement of vascular action and fever, which are considerably reduced, then I invoke the aid of colchicum, and give twenty or five-and-twenty minims of the wine of the seeds or the root, twice or thrice a day, and I often find the disease proceed uninterruptedly to its cure.

Again, when by the same ordinary course of treatment fever, pain, and swelling have been made to cease entirely, and have suddenly and unexpectedly returned, then I invoke the aid of colchicum, and give it in the same way; and a few doses are commonly enough to dissipate the returning disease, and restore the conditions of health. This is a pure case of relapse. The relapse, however, very seldom reaches the severity of the original attack.

Now on all such emergencies I have been accustomed to administer the remedy quite alone, uncombined with either alkali or opiate, so that the benefit which has resulted has been without question exclusively due to it; and not only exclusively due to it, but due to it purely as colchicum in virtue of that mode of action (whatever it be) which specifically belongs to it. For the cure has followed suddenly, and not waited for any intermediate operation of the remedy upon the stomach and bowels.

Thus I have gone as far as it is safe or profitable for you that I should attempt to go into the treatment of acute rheumatism. The rest you must learn by watching the actual management of cases in the hospital. I can tell you how to manage *a disease*, but not how to manage *a case*. One man may learn the principles of an art from another's discourse; but he must learn its practice, not from hearing him talk about it, but from seeing him in the act of exercising the art itself.

I must not dismiss, however, the treatment of acute rheumatism altogether without making one or two additional remarks, for fear that in time to come you may fancy that I have not represented the matter quite fairly and honestly. When some years hence you have gained abundant experience of this disease for yourselves, I can well imagine you commenting upon me and my practice thus:—"It is all very well to talk of bleeding, and opium, and calomel, and purgatives, curing acute rheumatism, and setting patients upon their legs in a week or two; so they will, in many cases. But cases are frequently occurring, in which neither singly nor conjointly will they do any thing of the kind."

Now this I believe to be the common fault of writers and lecturers, and of all who in any manner, or any where, undertake to teach practical medicine, except at the bedside of the patient, that they give much too favourable a representation of their subject. And it arises after this manner. In whatever they say respecting methods of treatment, they proceed in the meanwhile upon the assumption, that they have always *a good case* to deal with, and are always called in at the right time. Not only do they proceed upon this assumption, but they do it without saying so.

I can easily understand how, in order to give an intelligible account of the powers of medicine, it may be necessary to display it in operation upon states of disease which are most susceptible of its good impressions. But the teaching which proceeds upon these terms, whatever other merit it may have, is not the type of actual practice. For in actual practice there is no such thing as choosing your own cases—you must take the good and the bad as they come.

Thus there are cases which present their indications of treatment so clearly and prominently, that medicine is sure of its aim, and in which all the conditions of time and opportunity are so favourable that, rightly directed, it cannot fail of success. These we call, in our peculiar language, *good* cases; meaning that they are such as we like to see and like to treat, and have an interest and hope in, and expect our reward in their speedy cure.

But there are also cases in which there are no indications prominent or clear enough to become the special scope of practice, and in which time and opportunity have been postponed or lost, so that medicine is never sure of its aim; or, if it should happen to take the right one, it could hardly expect to reach it. These we call *bad* cases. We dislike them, and flinch from them, and can only bring ourselves to treat them as a matter of duty.

Acute rheumatism has its good and bad cases; its cases, in which the right treatment is seen clearly and instituted confidently, and pursued in full expectation of success, and success follows; and its cases, in which the right treatment is dimly discerned from the first, and the treatment which is adopted doubtfully, is pursued distrustfully, and ends in failure, or in a distant, tardy, and precarious restoration. Of these last I can scarcely do more than tell you that there are such cases—I cannot describe them.

Where the constitution of the patient is habitually cachectic, and he has no natural health to oppose to the casual incursions of disease, if that disease be acute rheumatism your treatment is apt to fail. Again, where the patient is seen late, and treated late, as in other diseases, so in acute rheumatism the best medical management is often unable to compensate for loss of time, and thus it often fails.

In turning over my records of this disease, I find that very few cases came under my observation and treatment during the first week; that the great majority were admitted into the hospital during the second, and as much towards the end of it as the beginning; that many were admitted in the course of the third, and some not until the fourth week, and even later.

Again, independent of any fault in the natural constitution of the patient, or any mischance of time and opportunity in the application of the remedy, there are certain forms of the disease in which it bespeaks itself less amenable to medicine. There is a form of acute rheumatism in which pain, from its extreme severity, is out of all proportion to the accompanying fever and vascular action. And there is a form in which fever and vascular action with most profuse perspiration and miliary vesicles are out of all proportion to the pain.

Not only degrees of pain, but its existence, in any degree, must be taken upon the testimony of the patient. And I have seen a few cases in which the complaint of it has been little or none at all, and the swelling of any joint has been little or none at all; and yet the fever has been characteristic of rheumatism in the highest degree, leaving some colour for speculation whether the disease were not in its essence *a fever.** Both these forms, that in which the pain exceeds the fever, and that in which the fever exceeds the pain, are liable to be lingering, and to resist the application of medicine for their relief.

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* The real distinction between inflammation and fever is found by M. Andral in the constituents of the blood. In inflammation its fibrin is always in excess; in fever never. Thus acute rheumatism is pre-eminently an inflammation, and is taken altogether out of the category of fevers.—*Hæmatologie Pathologique.*

But there is no such thing as calculating the results of medical treatment with certainty. Success and failure run contrary to expectation sometimes in every disease, but most of all in acute rheumatism. Where you would look for failure, you often meet with success, and *vice versâ*. Of rheumatism it may be said generally, that it is less within reach of the remedy in proportion as it is seen and treated at a period more distant from its commencement. Yet loss of time does not augment the difficulties of after-treatment, or diminish the probabilities of its success to the same degree in acute rheumatism as in other diseases of an inflammatory nature. I have often known acute rheumatism of the severest kind have the start of the remedy full ten days or a fortnight, during which nothing whatever has been done for its relief; and, when at length the remedy has been applied, it has been cured as easily and rapidly as I could promise myself that it would have been, had I taken it in hand ten days or a fortnight sooner.

Surely here is something remarkable enough to make us stop and think of it for a moment. An inflammation of the brain, the liver, or the lungs, would not thus wait our pleasure or our neglect, and be as curable ten days or a fortnight hence as it is to-day. For inflammation in these organs does not stand still. It is progressive from stage to stage, and each succeeding stage carries it further and further away from the remedy. But it is the very peculiarity of acute rheumatism that it *does*, in a certain sense, stand still. All its actions and movements are simply as forcible and rapid as possible, yet does it stand still. All its energy is expended upon one stage, and there is no apparent progression beyond it. A fortnight ago there was great heat, and nervous and vascular excitement, and great pain and swelling of the joints; and to-day the heat, and nervous and vascular excitement, and pain and swelling, are exactly of the same amount as they were at first. There is no more sign of parts disorganised, or parts destroyed, now than then. Verily, it seems as if the disease had waited to be cured all the while. This peculiar pathological condition may, in fact, be the reason why, after great loss of time, acute rheumatism is still curable, and often easily and rapidly cured.

But further, as in the treatment of acute rheumatism you often meet with success, where from present circumstances, and the analogy of other diseases, you might reasonably expect failure, so you often meet with failure, where from present circumstances and the analogy of other diseases, you might reasonably expect success. As there are frequent cases which suffer no detriment from delay, but when the suitable remedy comes, though it come late, are still ready to be cured, so there are cases which reap no advantage from the earliest and best treatment, or from the habitual healthiness of the patient, but are still slow and reluctant to let go the disease. I have seen the joints swelled and severely painful, the whole surface burning hot, and steaming with perspiration, the vascular system acting with prodigious force, and the nervous system wild with suffering for weeks and weeks together in young and robust constitutions, and in spite of remedies seasonably employed to fulfil all rational indications. Here is an assemblage of conditions not to be found (I suspect) except in rheumatism: the conditions of acute and chronic disease are united in the same subject; actions the most rapid and forcible, and sufferings the most severe, yet both enduring for a long and indefinite period. This rheumatism, which is most acute, and at the same time most chronic, has, at length, worn itself out spontaneously, or has ceased under the influence of some remedy, whose mode of operation we know nothing about—colchicum, iodide of potassium, conium, sarsaparilla, cinchona.

I wish I had none of these unexpected issues to tell you of. They must disappoint your calculations, and disturb your satisfaction, just when you were, perhaps, beginning to look with complacency on the happy results of certain straightforward methods of practice which dealt in simple and powerful means, and fulfilled plain and intelligible indications, and were said to do their work, upon the whole, quickly and successfully.

But if I undertake to instruct you out of my little book of experience, I hold it but honesty to read it straight through. There is no such thing as turning practical medicine into a well-told tale. Besides, I doubt whether these exceptional cases of acute rheumatism are not those which especially deserve studying, and which promise more than ordinary fruit to the research of the pathologist.

There are in acute rheumatism fever, and inflammation, and pain. And venæsection and opium and calomel with purgatives have abated them, and oftentimes wrought their cure. And it is wise still to direct our remedies rather in the ways that we know, than in the ways that we know not.

But probably there is more in this disease than fever, and inflammation, and pain. And probably there is more in these remedies than the mere power of softening the pulse, and soothing the nerves, and draining the abdominal viscera of their secretions. As the disease may have an essential element beyond its sensible actions and sufferings, so the remedies may have secret operations beyond those which are seen and palpable. And it may be in virtue of those that they cure, and not of these.

Still we must be content to apportion the remedies according to such of their operations as we understand, and leave them to exercise, as they may, any others which they possess; believing that those, which we do not understand (though more immediately curative), are closely allied with those which we do, and are ruled and regulated by them.

But, in the mean time, we cannot but wonder that, in the same conditions of disease, other remedies have proved unquestionably curative, without any intermediate operations of the same kind. Nevertheless, among several remedies, equally curative in their ultimate effects, but how we know not, it is best always to choose those, any part of whose action we can see and control. In whatever bark we put to sea, let us have a helm to lay hold of, if we can.

Thus much I have thought fit to say of the treatment of acute rheumatism. And all that I have said applies to it as a disease consisting of fever and inflammation of the joints, and of nothing more. And, indeed, acute rheumatism, as far as the knowledge of former times went, was a fever with inflammation of the joints, and nothing more. And I heartily wish that the observation of our own times had added nothing to it. But I am not lamenting the fruits of clinical and pathological research, or desiring to recede within the limits of a narrower knowledge. I am only regretting that the things themselves, which modern physicians have discovered, should be discoverable, or in other words, should have a real exist-

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ence. For they add so much to the perils of the disease, and the perplexities of its treatment, that for my own part I would rather suffer a typhus fever than an acute rheumatism.

Now all these perils and perplexities arise from endocarditis and pericarditis being oftentimes found to form a part of it. But how to form a part of it? Why, I believe that the popular notion regards the disease as it was formerly regarded, as a fever with inflammation of the joints, and that it views the endocarditis and pericarditis, whenever they occur, as mere accidents. But I cannot think so. On the contrary, I must believe that the rheumatism, of its own nature as a disease, engenders the endocarditis and pericarditis, otherwise I could not have deemed it necessary to dwell so long upon its treatment before I came to the treatment of them.

Let me here, in as few words as possible, give you and myself a little caution against being unawares led to take various opinions and beliefs in medicine for settled truths, because the terms in current use among medical men would imply that they are so. Endocarditis and pericarditis are commonly spoken of as *incidental to* acute rheumatism. But beware of language, for it is often a great cheat. An incident is something that possibly may happen—a casualty. But whether endocarditis and pericarditis arise in two-thirds, or in one-half, or in not more than one-third, of all the cases of acute rheumatism which occur, still to say of them that they are possible casualties, would lead people greatly to underrate their frequency, and greatly to underrate, too, the amount of peril which belongs to the disease, entirely from their being a part of it. Besides, to speak of them as incidental, seems to settle at once that their relation to the rheumatism is of a certain kind. But who shall say that endocarditis and pericarditis are not equally *essential* to it with inflammation of the joints, and that both are not equally derived from the attendant fever? Or who shall say that the arthritic inflammation and the cardiac inflammation, and the fever itself, with its profuse and sour-smelling perspirations, and the urine, loaded with lithates and red colouring matter, do not all spring from some noxious principle formed in, or finding its way into, the blood, this last containing, in truth, the *essence* of the disease?

Organic chemistry alone can settle the point, and probably will settle it some time.

In the mean while we are called to treat acute rheumatism, and all that belongs to it, upon such knowledge as we possess. But in so doing, let us not deceive ourselves into believing that we know more than we do, merely because we choose to adopt terms which seem to imply great knowledge. "Incidental" and "essential" are words which have a show of wisdom. But we are not sure that the phenomena of the disease to which they are applied can, with propriety, bear to be so designated. The words vouch for more than at present is actually known.

LECTURE XII.

PREVENTIVE TREATMENT OF RHEUMATIC ENDOCARDITIS AND PERICARDITIS CONSIDERED.—IN THE MANAGEMENT OF ACUTE RHEUMATISM CAN ANY REMEDY BE USED AS SPECIALLY PREVENTIVE OF, OR ANY REMEDY BE AVOIDED AS SPECIALLY CONDUCIVE TO, ENDOCARDITIS AND PERICARDITIS?—IS OPIUM PREVENTIVE? — IS VENÆSECTION CONDUCIVE? — IN WHAT THEIR PREVENTIVE TREATMENT REALLY CONSISTS.—THEIR ACTUAL TREATMENT.—IT SHOULD BEGIN WITH THE EARLIEST NOTICES OF THEIR EXISTENCE.—WHAT THESE ARE IN THEIR SEVERAL VARIETIES.—WHY, IN ACUTE RHEUMATISM, THE HEART, BEING INFLAMED, NEEDS A SPECIAL TREATMENT, WHILE THE JOINTS BEING INFLAMED NEED IT NOT.—THE TREATMENT OF THE HEART, HOWEVER, BY THE SAME REMEDIES AS THE GENERAL DISEASE.—BUT THIS TREATMENT MADE SPECIAL BY THOSE REMEDIES BEING USED WITH A DIFFERENT FORCE, AND IN NEW DIRECTIONS.—BLEEDING AND OPIUM USED THUS.—THE CONSIDERATION OF THE USES OF MERCURY POSTPONED.

WHENEVER endocarditis or pericarditis has made a part of acute rheumatism, it has rarely been present from its commencement, but has in almost every case been superadded to it during its progress. There have been fever and inflammation of the joints for an uncertain period, before the affection of the heart has arisen.

I say, in *almost every case*. For I have known exceptions: I have seen cases in which the inflammation of the heart has been declared as soon as the inflammation of the joints: even as soon as the disease could be called rheumatism, endocarditis or pericarditis has been already a part of it. And I have seen a few cases (but very few) in which the inflammation of the heart has seemed to precede the inflammation of the joints. There has been fever, and with it palpitation and præcordial pain. Thus far the disease has been a puzzle. In a day or two the joints have become inflamed, and shown the disease to be rheumatism; and the endocardial murmur has been added to the palpitation and to the præcordial pain, and shown the sure existence of endocarditis from the beginning.

But beyond all question in the vast majority of cases, where endocarditis or pericarditis has eventually appeared, the rheumatism has begun, and proceeded for a time without any symptoms immediately referable to the heart.

Now, if experience has found any treatment which is preventive of endocarditis or pericarditis, this is the time for carrying it into effect—the time of the heart's immunity, which would thus become the most eventful and most important period of the disease.

Whether there be any special safeguards or modes of rescue, that can then be put in force, I will consider presently. But, alas! I must first tell you that *the time* is too often past before the disease is brought under our care and treatment. The poor are the most frequent subjects of acute rheumatism; and the following record will show in how many the precious opportunity of preventive treatment was already lost before they reached the hospital.

Out of the 63 cases of rheumatic endocarditis the endocardial murmur was found to exist upon the patient's admission in 27; that is, in 3 cases out of 7. And out of the 18 cases of rheumatic pericarditis the exocardial murmur was found to exist upon the patient's admission in 9; that is, in one half. Further, out of the remaining 45 cases of one or other of these diseases, although upon admission the sure auscultatory signs were present in none, yet in many there were præcordial pains, or palpitation, or irregular pulse, or catching of the breath; and it was often part of their history, that they had existed some time previously. But where these were, there the endocardial or the exocardial murmur was sure to follow, thus denoting infallibly the nature of the disease, and at the same time plainly interpreting the meaning of the symptoms which preceded them, and showing that they were derived from the same endocarditis or pericarditis with themselves.

I have already shown that, from the condition in life of those who are most apt to suffer it, a considerable period is wont to elapse after the acute rheumatism has begun, before it is subjected to medical care; a loss of time and opportunity often unpropitious to the treatment of the entire disease, and (it now appears) still more disastrous in prohibiting the use of all possible means to prevent those affections of the heart which impart to it its most formidable character.

But still acute rheumatism is presented often enough to our observation unaccompanied by these affections of the heart to allow the fair trial of means for preventing them, if any such there be. Now, I believe there *are* means which answer this among other purposes; but *no special* means to answer *this special* purpose.

I am aware that the treatment of acute rheumatism by large and often-repeated doses of opium (much larger doses and oftener repeated than I have been accustomed to employ) has obtained the high recommendation of being a safeguard to the heart. Nothing, however, is more difficult than to reach satisfactory conclusions upon points of this kind. Only consider what a vast number of comparative trials is needed to prove that one remedy has greater power than another to mitigate or arrest even *actually existing* symptoms; and then think of the infinitely greater number of such trials required to show one remedy more efficacious than another in preventing certain symptoms, which possibly might have been, but which never actually appeared.

On the other hand, there is a remedy which I have heard emphatically denounced as inadmissible in the treatment of acute rheumatism, because it favours the metastasis, or the extension of the disease from the joints to the heart: this remedy is venæsection. And if, in my belief, the imputation were true, I ought to warn you seriously against its use. For, practically, preventive caution and preventive treatment are the same thing.

But I believe that the omission of venæsection might be denounced with as much justice as the practice of it for increasing the liability of the heart to suffer in the progress of acute rheumatism. The truth is, venæsection can neither be commended nor discommended *absolutely* on any such grounds. It guards the heart, or it exposes the heart, according as it is or is not employed in proper season and in proper measure.

All that has been said of the right and wrong use of venæ—

section in the management of the general disease might now be repeated, with the particular aim of preserving the heart untouched. Omit venæsection altogether, where the patient is young and vigorous, and where pains, and swelling, and fever, and vascular action, and all that characterises inflammation, are in excess, and you fling away the remedy of greatest power both for curing what is, and for *preventing* what may be. All other remedies put together cannot compensate the loss of this, whether for cure or for prevention. Nay, all other remedies, for want of the preliminary impression which this alone can exercise upon the blood-vessels, will, each of them, fail of their proper efficacy, and be almost as if they had not been employed at all. Thus, the inflammation is both unmitigated in the parts where it is, and unrestrained from going wherever else it will; and so it goes, whither it naturally tends, to the heart. All this I have seen, and know.

Or employ venæsection recklessly and beyond the necessity of the case, and in great excess, and you may cure the rheumatism at once, or you may so abate the force of all its symptoms as in a manner to suspend it. But, whether you cure it or suspend it, it must be by *a shock*. And, if you do but suspend it, as the constitution recovers from its shock, and as the disease returns afresh, there is a perilous chance that it may not be exactly what it was before, but something worse. Before the unsparing venæsection it was a fever with inflammation of the joints only; in lighting up anew after the venæsection, it may be a fever with inflammation of the heart as well as of the joints. This also I have seen.

There is a lesson which we are apt to learn slowly, but which all of us come to learn at last. It is this—that while present pain and present peril call loudest for relief and rescue, still in relieving and rescuing, the ultimate well-being of the patient must not be disregarded altogether.

To compare great things with small, it is not only in the art of war that an imprudent victory has been the beginning of many disasters.

Whatever be upon the whole the best treatment of acute rheumatism, the same may be considered the best safeguard against extraordinary perils belonging to conditions which may arise in the course of its progress. While it promotes the cure, it tends to restrict the disease to the parts which it at present occupies until the cure is complete. And whatever be the worst treatment of acute rheumatism, the same is the surest exposure to those perils against which the best treatment is a safeguard. While it delays the cure, it allows the disease time to travel beyond the parts which it at present occupies to others, which in its own nature it is liable to seize upon.

But suppose the heart to be *actually* attacked with inflammation, what is to be done? I am sure I cannot tell you summarily, and in the gross, what is to be done. I must first bring together some circumstances and conditions of actual practice, and place you (as it were) in the midst of them, and then teach you how to act when I have taught you how to estimate the emergency.

Take a case which you have watched and treated day after day; a case in which day after day you have examined and listened to the chest, fearing and guarding against surprise, and have felt all possible confidence that hitherto the heart is free. In such a case pain arises, distinct and sudden pain in or near the præcordial region; or the heart suddenly begins to beat with excessive impulse; or the heart, as if struck with weakness, suddenly begins to flutter and act irregularly. But withal your ear detects neither bellows-murmur, nor sound of attrition. What then are you to think of the disease, and what to do? You are to conclude that inflammation is begun in the heart, and you are to take measures to subdue it without a moment's delay.

Pain in the heart; excessive impulse of the heart; irregular action of the heart; any one of these, or any two, or all of them together, coming on in the course of acute rheumatism, make inflammation of the heart so nearly certain, that it would be folly to suspend the remedy by waiting for more certainty, and so running the hazard of having a more advanced and less tractable disease to deal with.

But what is it you would wait for to make the fact of inflammation certain? The auscultatory signs, perhaps. And I may be told that I cannot be absolutely sure without them. But there are cases in which it is your duty to be *practically* sure, before you are sure by *the card*; and this is one of them. You would not sacrifice men's lives to the vanity of diagnosis. The auscultatory signs, when they come, will only serve to localise the disease. Its nature is plain enough already; and we treat *its nature*, and not *its seat*.

The truth is, if the heart be to suffer inflammation, it is a most happy circumstance, that the first notice of it should be thus declared. Happy, however, only, if such notice be understood and acted upon.

But do not imagine that I wish to disparage auscultatory signs, because I here so strongly insist, that you should trust to other signs, and proceed without them. Presently you will see how entirely I confide in them.

Take another case of rheumatism, in which you have been daily upon the watch for the least sign of evil befalling the heart, and hitherto have found none: no pain, no excess of impulse, no irregular action. In such a case, when you least expect it, you may hear something unusual in the heart. It may be its systolic sound prolonged in an undue degree, or a little harsh, and nothing more. Yet this, if it be really so, even this alone is enough to call for instant measures to subdue inflammation of the heart. For it is almost certain that by to-morrow, this sound, a little more prolonged, and a little harsher than natural, will become a genuine bellows-murmur, and declare the sure existence of endocarditis.

Indeed I am not over-refining in this matter, and those who are in the habit of attending my visits to the wards know that I am not. They know, too, that I have taken some pains not to be deceived about it. For it is hard to judge and decide truly upon our smaller perceptions; upon things which reach the senses, indeed, but strike them only feebly and faintly. Yet, when these smaller things have such important meanings as they have here, judge we must, and decide we must, using all caution to avoid error.

When, therefore, in acute rheumatism my ear has told me of a more prolonged and somewhat harsher sound of the heart than natural, I have not been content until I have found another ear (some well-instructed and experienced one) to bear testimony to the same fact, and give me assurance that my own did not err. And then I have ventured to play the prophet, and to foretell that, by the next day, this sound would be a bellows-murmur, and inflammation of the endocardium would be unquestionable. To me it has been unquestionable already, and so, not waiting for to-morrow, I have begun its treatment at once.

Take another case of rheumatism, in which neither præcordial pain nor excess of impulse nor irregular action have hitherto drawn attention to the heart, nor do they now. But now your ear may begin to admonish you of something belonging to the heart, which was not there the last time you listened: a sound which is no modification of what is found in health, but is entirely new, and unnatural. This sound may be as yet audible in so small a space of the præcordial region, that, of several who have been carefully listening to the patient's chest during the last half hour, one only has happened to light upon it. Yet it is so sure and certain a reality, that no sooner is attention pointed to the spot, than all can hear it, and all have no doubt of it. The sound is an indefinite sound still; each person who hears it likens it to something different. It is not such as can fix disease either upon the endocardium or the pericardium. But coming on in the course of acute rheumatism, it must be taken for an announcement that all is not right in the heart, that it has begun to suffer after the manner to which acute rheumatism renders it obnoxious, and that it is already in a state of inflammation. Therefore the remedy must no longer tarry. Ere a day is gone, this indefinite sound will be changed into an endocardial or exocardial murmur.

Take yet another case in which, from the absence of all symptoms referable to the heart, you believe it to be hitherto unhurt. You listened perhaps a few hours ago, and still found nothing to excite suspicion. And now listening again you hear the endocardial, or you hear the exocardial, murmur completely formed. These sounds, being the concomitants of acute rheumatism, announce at once inflammation of the heart, and fix its seat either in the membrane which lines it within, or the membrane which invests it without. Here nothing is wanting to the instant and complete disclosure of the disease; and nothing should be wanting to the immediate and efficient treatment of it.

These are the ways in which I have seen endocarditis or pericarditis begin, when I have witnessed their beginning. Things different in kind, a pain, an impulse, or a sound; things great or small, palpable, or hardly discernible, and never discerned but by the practised sense, have given the first authentic notice of these awful diseases. Therefore the eye, the ear, and every sense and faculty, which can convey intelligence of what goes on within a man should be kept upon the watch for these things.

I have learnt the good of knowing, and the evil of not knowing, their import. And truly do I wish that I could live a few past years again, and carry back with me my present experience for the sake of treating again some cases of rheumatic endocarditis and pericarditis, and of treating them better. I fancy I could *now* save some hearts from permanent injury which then I did not save.

If I had to treat certain cases which I have seen, when there was complaint of pain in or about the præcordial region, I should not speculate about its possibly being an intercostal pain, and so delay for a while (as I have) the treatment of the real disease. When there was excessive impulse of the heart I should not wait, moreover, for a certain unnatural sound to tell me what it meant; and when there was an unnatural sound of an indefinite kind, I should not make treatment tarry until this sound became an unquestionable bellows-murmur, or sound of attrition. Heretofore, I confess, some such cases had not the best treatment at my hands, because they had not the earliest. And they had not the earliest, because I did not clearly discern the earliest notices of the disease; and so it had the start of my remedy.

These confessions I freely make, that you may profit by them. I cannot carry my experience backward, but you may carry it forward. And it is in the hope of some practical good to come from it, that I have thus analysed and exposed it.

But you must not from my own confessions take occasion to blame me. The whole subject was new to clinical research. And, long after much general acquaintance with it had been obtained, those many smaller pieces of knowledge, by which especially practice is perfected, were yet to be picked up and examined, and rated at their just value. Do not blame me, that I did not find them, and take them, and turn them to all their best uses in a moment.

Well! then, now you know the signs, which in acute rheumatism are fit to raise alarm, and to proclaim that all is not well with the heart. And whenever any of these appear, whether auscultatory or non-auscultatory, many or few, great or small, whether enough to indicate the disease, but not to determine its exact seat, or enough both to declare it to be inflammation, and to fix its seat in the endocardium or pericardium, or in both simultaneously, your treatment must at once be directed to the heart. But what is that treatment to be?

It has been already said, that in acute rheumatism the treatment of the joints may be safely merged in the treatment of the general disease. And why so? Because in acute rheumatism inflammation of the joints, be it ever so severe, is not wont to terminate in their disorganisation. The fibrous, cellular, and synovial structures, which compose them, will abide in a state of inflammation for weeks, and suffer the matter which inflammation effuses (fibrin and albumen) to be deposited within them and about them, and yet in the end recover their perfect soundness and integrity.

But in acute rheumatism the treatment of the heart cannot be safely merged in the treatment of the general disease. And why not? Because inflammation of the heart tends to a destructive disorganisation. Every day that it is allowed to abide and continue its progress, the heart sustains more and more injury from morbid matter deposited upon it or within it, and its functions are hindered and baffled, and at last abolished; and these functions are vital.

When the question is of the joints, it might be laid down as a maxim of practice, to treat the rheumatism (or the general disease), and let the joints take care of themselves. But when the question is of the heart, the maxim might be stated conversely; to treat the heart, and let the rheumatism take care of itself. For inflammation of the heart, whether endocarditis or pericarditis, being the accompaniment of acute rheumatism, is to be managed by the same methods and remedies as it would be, were it alone and idiopathic. And these methods and remedies are such as might not be employed at all, or certainly not to the same extent, in a rheumatism attended only by inflammation of the joints.

Now I admonish you that I am going to enter into bedside details. For I can teach you nothing unless I do, and you can learn nothing unless you attend to them. Bloodletting, and mercury, and opium, are your remedies for these diseases of the heart. And so they are for acute rheumatism, irrespective of inflammation of the heart. And so they are for twenty diseases besides. But little practical instruction is conveyed simply by announcing the fact. For in each of the twenty diseases, nay, in each case of any one of them, they may need to be employed in different modes and measures. Thus they are only *conditionally* curative after all. But is not this almost as much as can be said of the application of any remedy to any disease? Conditions mix themselves with all medical practice. To know the disease and to know the right remedy, are only first steps towards the right treatment. The success, and even the safety, of practice come from knowing things which lie far beyond. Stop here, and you will soon find it much easier to kill a man with the *right* remedy than to cure him.

Bleeding, mercury, opium, the very remedies you used in acute rheumatism, are (I say) still your main reliance, when inflammation attacks the heart; but bleeding in different modes and measures, mercury directed to a totally different purpose, and opium given with more than one single intention.

As soon as inflammation is known or suspected to have reached the heart, mercury must be given without delay. Or should mercury be already in use, as a remedy for acute rheumatism, with the intent of obtaining large evacuations from the bowels, it must at once have a new direction given to it. The irritation it has produced within the abdomen must by all means be pacified, and its constitutional impression must now alone be thought of,—that impression, of which salivation is the best evidence, of which (as far as we know) it alone, of all remedial substances, is properly and exclusively capable, and which, under favourable circumstances, is largely counteractive of inflammation.

But, inasmuch as that impression of mercury, or salivation, which is the best evidence of it, cannot be commanded within any given time, you must be content to administer it in the manner calculated for this purpose, and wait the event. For no judgment can be formed of its curative effect upon the disease until salivation arrives. And it may arrive in a day or two, or not until after several days, or after a week, or after several weeks, or it may not arrive at all.

You must give mercury, then, and wait until salivation come to tell you what it has done for the disease, or until it is fair to conclude there will be no salivation. And it does, I confess, require strong confidence in this great remedy, thus to give it, and thus to wait for its ultimate effect, when in the mean time it displays no proximate or intermediate effect as an earnest of its curative operation.

But as in actual practice, so in description, we must now leave this remedy for a while, supposing it to be duly given and duly in operation towards its ultimate effect, and return to it again, when we have considered the uses of the other remedies.

Now the other remedies, while they have their ultimate effect, which is to be seen and judged of in the end, have their immediate effects, which are to be seen and judged of from day to day, and from hour to hour. Their ultimate effect is to cure the inflammation. Their immediate effects are to abate pain and anguish, and dyspnœa, and palpitation; to quiet the nervous system, to produce sleep, to moderate fever.

With respect to venæsection, if in acute rheumatism any of those symptoms referable to the heart are present, which have been already mentioned, auscultatory or non-auscultatory, and especially if they have arisen under your own observation, or, though not under your own observation, if they be now present, and you have reason to believe that they have *recently* arisen, then, should the pulse be found to have even a notable degree of that hardness which is deemed inflammatory, blood must be taken from the arm. Should there be any doubt about venæsection, any misgiving whether the inflammatory hardness of the pulse is quite enough to require it, let it be employed nevertheless. There is greater hazard in omitting it wrongfully than in practising it wrongfully.

But with the same amount of vascular action evidenced by the state of the pulse, in a case of mere rheumatism, in which the heart was not affected, venæsection would be neither necessary nor proper.

Again, if in acute rheumatism, with symptoms referable to the heart and those recently declared, fever and vascular action run very high, and there be extreme fulness and hardness of the pulse, a copious venæsection should be practised. And the same should be repeated, were the hardness and fulness of the pulse found not to yield. And repeated again and again, until the hardness and fulness of the pulse were much abated.

With all this fever and inflammatory action, and all this hardness and fulness of the pulse, had the case been one of mere rheumatism, and the heart unaffected, venæsection would have been properly employed, indeed once or even twice, but it would not have been carried further for reasons formerly assigned. Now, however, more danger is to be feared from the progress of inflammation in the heart, than from any shock imparted to the nervous system by loss of blood.

But though the disease be inflammation, and the organ inflamed be a vital organ, even the heart, bleeding must have a limit; for bleeding cannot alone be trusted to cure the disease. Mercury must become its auxiliary. And if for no other reason than to obtain from mercury a fuller curative operation, bleeding must have a limit.

Looking, as I do, mainly to mercury to save life, or to save the organ, I am constantly careful in the management of every case to do every thing to aid, and nothing to hinder, its curative operation. Especially in the use of venæsection, I bear this in mind; for sure I am that loss of blood can both aid and hinder it according to its amount.

In men of florid aspect and full blood-vessels, though *bleeding* has not been needed for its own sake, yet has it oftentimes been *moderately* used for expediting the sensible effects of mercury. And the sensible effects thus induced have been at the same time curative. But, if the body be first made exsanguine by the lancet, you may gain the *sensible* effects of mercury, and lose the curative; for the two do not of necessity go together.

As mercury can be less trusted for its antiphlogistic power in those who either naturally or from previous disorder are pale and anæmic, so in the robust and sanguineous if you would have mercury exercise what power it has for the control of inflammation, you must beware of *making* these what the others *are*. You must hold your hand from excessive venæsection. In inflammation of the heart you must not first change a fine ruddy countenance into the aspect of a chlorotic girl, and then leave mercury to complete the cure without anxiety or distrust of the event.

Recollect, then, that in rheumatic inflammation of the heart, whether it be endocarditis or pericarditis, bloodletting by venæsection is to be little in one case, and much in another, according to the present force of vascular action throughout the body: little or much respective to its own proper benefit as a remedy; and little or much respective to its secondary uses in procuring the more effective operation of mercury. And, recollect, moreover, the cautionary admonition applicable alike to the management of this and of all diseases in which a large share of the cure is confided to mercury; recollect, not to lessen or to lose its curative operation, either by bleeding too little or bleeding too much; for plethora and anæmia are alike obstructive of it.

But there are other modes and means of bloodletting besides venæsection. There is cupping, and there are leeches.

Now in rheumatic inflammation of the heart, cupping or leeches, or both, may be needed as auxiliary to venæsection: or, exclusive of venæsection, they alone may be needed and trusted for taking as much blood as the nature of the case requires.

As it often happens to other organs when they are inflamed, so also to the heart, that, when general vascular action has run high and venæsection has been employed to reduce it, and *has* reduced it effectually, the local symptoms will remain altogether, or almost unmitigated. Thus pain and palpitation of the heart, and unnatural sounds, often abide in the same degree, or nearly so, after venæsection as before it; and then cupping or leeches come in as effective auxiliaries, and the local bleeding often makes at once an appreciable impression upon what the general bleeding has not touched.

Again, as in other parts of the body, so in the heart, it is no uncommon thing for inflammation to begin and proceed onwards to destructive disorganisation *without being felt as an inflammation* by the constitution at large. It imparts no special hardness to the pulse, and no extraordinary force to the circulation, yet it is working its own injurious changes locally; palpitation, or pain, or irregular action, or unnatural sounds, declare as much. Here all that bloodletting can compass for the relief of the disease and its symptoms will be attained by cupping, or by leeches alone.

Now there is a choice between cupping and leeches. One may be a more appropriate remedy than the other in a particular case; and yet I dare hardly trust myself, apart from the patient, to point out what it is that should determine you to prefer one to the other.

So dexterous are those who are well practised in the art of cupping that they can make their glasses draw a given quantity of blood in almost as short a time as the lancet; whereas leeches are long at work in taking away the quantity you desire. Therefore, upon the principle of requiring in the remedy a force and rate of operation proportionate to the force and rate of the disease, I should say that when the pain or anguish, or by whatever name you call the distress immediately referable to the heart, begins suddenly, is at once felt severely, and augments rapidly, then cupping is the remedy; but that, when it comes on by little and little, and increases slowly, and has not yet reached a great amount, then leeches are the remedy. But leeches are often needed as auxiliary to cupping, just as cupping is to venæsection.

There is another thing worth mentioning as to the use of these remedies. When I have employed cupping in inflammation of the heart, I have been accustomed to have the glasses applied between the left scapula and the vertebral column. Applied upon the præcordial region, they have seemed to me to cause peculiar distress, and to be not without the hazard of doing mischief and violence to the heart in its present condition: for recollect that *now* a slight percussion upon the cartilages of the ribs, or any degree of pressure which shall carry them ever so little downwards towards the heart, will often occasion pain. Besides, blood taken from between the scapula and the spine produces all the relief to the heart which could be expected.

But we must come nearer yet to the bedside of the patient, and look still more closely into the immediate effect of bloodletting in inflammation of the heart. Its effect, day by day, is the earnest of its ultimate effect. The sensible impression of each venæsection, or of each cupping, or of each application of leeches, is a measure of the good they are doing, and of the trust to be reposed in them as remedies. But what is this effect which is to be looked for day by day?

In inflammation of the lungs or pleura, bloodletting shows its favourable impression by setting free the respiration and diminishing pain. In inflammation of the brain, by abating delirium, or coma or spasm, by restoring clearness to the senses, and intelligence to the mind; in inflammation of the peritoneum, by softening the tense abdomen, and making it more patient of pressure. And if the heart be inflamed either within or without, any of the several modes of bloodletting will denote itself to be exercising a curative power on the disease, when it moderates pain, or when it moderates excessive impulse, or when it renders its beats regular again, which were irregular before. Thus it is in the sensations and functions of the heart as of other organs, that we see the benefit which bloodletting is doing, or is ultimately to do, towards the cure of its inflammation.

Next as to the use of opium. It indeed is needed now that the heart is inflamed, to calm the nervous system, and to abate pain, as it was needed before; and, moreover, it is needed for another purpose, viz. to give effect to the operation of mercury in one mode at least of administering it.

If in aiming to produce salivation you give calomel internally, you must restrain it from running off by the bowels: and this can only be done by opium. Opium must be combined with every dose of calomel, and the quantity of each must be proportioned to the other. Thus, perhaps, we shall generally find ourselves compelled to give more opium for the purpose of keeping the bowels patient under the stimulus of calomel, than we should give merely to soothe the nervous system under the general irritation of the disease. But, as the remedial operation of mercury is not now under consideration, it is unnecessary to say more at present of opium as its adjunct and auxiliary.

Beside, however, these its common uses of calming the nervous system and abating pain and aiding the effect of mercury, opium has its extraordinary uses for extraordinary emergencies. In endocarditis and pericarditis, not always, but most commonly, pain is present; pain of the heart varying in amount, and upon the whole abiding, yet allowing remissions and abatements. But whether this customary pain be present or no, a sudden agony will sometimes seize the heart, and at once the patient will feel and look as if he had received his death-blow. It is like a spasm of the heart. It is no other than a paroxysm of angina pectoris. This terrible seizure attends pericarditis more frequently than endocarditis, and where it has once occurred, it is apt to occur again. Its only remedy, as far as I know, is a large dose of opium. Opium is only means of rescue during the agony, and the only safe-rd against its return.

Thus it is with opium as it is with bleeding. Day by day akes its sensible impression both upon the constitution at e, and upon the diseased organ. It is pre-eminently tive and anodyne and antispasmodic. And so day by day curative in a certain measure, and gives assurance that it ontributing in the mean time to the ultimate cure.

Well, then, while we look to *feelings and functions*, both stitutional and local, and gather notices from them that our edies are working beneficially towards their end, have not auscultatory signs some intimations of the like import to us? Having gained great information from them respect- the nature and seat of the disease within the heart, and the od of its commencement, we are disposed to look to them ll us of its decline and reparation. And no doubt they do us a great deal ultimately. They give us all the knowledge can be gained of the condition to which the heart reverts ast. But in the mean time, are not changes to be sought in the auscultatory signs day by day as bleeding after ding, or remedy after remedy (be it what it may) is loyed, changes which shall show the curative effect of the tment now in progress?

Experience says that changes in the auscultatory signs do occur after this manner; and the nature of the thing shows they cannot.

By venæsection or other modes of bleeding, by a blister or dose of opium, pain, anguish, or palpitation or irregular n of the heart, are subdued or pacified, or made more able; and the same symptoms returning, are again brought r by the same remedies. But in the mean time, the mur-s, endocardial or exocardial, which have been present from beginning, do not come and go, and rise and fall. When or anguish, or palpitation, or irregular action of the heart, e greatest, the unnatural sounds are not the loudest. When e are the least, these do not become faint or inaudible. So experience.

Now only consider how different in their very nature are symptoms and *these* auscultatory signs, and wherein that rence consists, and you will presently see how it comes to pass that they cannot both be brought under equal degrees of abatement and control by the same remedies.

Pain, anguish, palpitation and irregular action, are things purely vital. They are the sensibilities and functions of the organ exalted and hurried, and baffled by the present stimulus of inflammation. And so far as the remedy can subdue it partially or entirely, temporarily or permanently, they are made to subside or to cease for a while, or altogether. But the endocardial and the exocardial murmurs are annexed to purely mechanical conditions, and proceed from new substances formed within and without the heart. And as long as these substances remain, whether the heart move forcibly or feebly, rhythmically or irregularly, with pain or without pain, it cannot move without the accompaniment of these sounds.

It is true that these substances are formed by the blood-vessels engaged in the inflammation. But the products of the inflammation remain for a time after the actuating principle and vital movements of the disease have ceased. And as long as they remain they have *mechanical* effects according to their kind, their seat, and their degree. As long as lymph abides upon the internal lining or external covering of the heart, though inflammation have entirely ceased, unnatural sounds must result. As long as the blood has a thickened valve, or an unequal surface of the endocardium to pass over, it must pass with a whiz. As long as the folds of the pericardium, being still free to move, encounter ruggedness and inequality, they must move with a grating noise.

Learn, then, to read aright the meaning of these two orders of symptoms referable to the heart,—the vital and the mechanical. Beware, especially, when the question is concerning the effect of remedies upon the disease, of mixing or confusing the intelligence which each has now to give. The vital symptoms, when they cease, denote that the inflammation has come to an end. The mechanical symptoms, when they yet continue, denote that the products of the inflammation remain. The two do not speak a contradictory language, but they speak of different things.

LECTURE XIII.

HE GENERAL QUESTION CONSIDERED OF MERCURY BEING A REMEDY FOR INFLAMMATION.—CONDITIONS FAVOURING ITS REMEDIAL OPERATION.—THESE FOUND IN THE NATURE OF THE INFLAMMATION, IN THE PART IT OCCUPIES, AND IN THE CONSTITUTION OF THE PATIENT.—ITS REMEDIAL OPERATION EITHER ANTIPHLOGISTIC OR REPARATORY.—THE FIRST CHIEFLY DISPLAYED IN THE INFLAMMATIONS OF TROPICAL CLIMATES.—PARALLEL FORMS OF INFLAMMATION HARDLY KNOWN IN THIS COUNTRY.—WHAT COME NEAREST TO THEM.—THE EFFECT OF MERCURY IN THESE NOT ALONE, BUT CONJOINTLY WITH BLEEDING.—THE PROBABLE NATURE OF ITS ANTIPHLOGISTIC OPERATIONS INFERRED FROM ITS EFFECTS, ESPECIALLY IN TWO KINDS OF INFLAMMATION.—ITS REPARATORY OPERATION SHOWN BY INSTANCES.

As a further remedy in the treatment of endocarditis and pericarditis, I would proceed next to speak of mercury. But I find myself unable to manage this part of the subject intelligibly, without first making you acquainted with my notions of the use of mercury in inflammation generally.

Upon a matter like this more uniform and settled opinions than we find might have been expected among medical men. Some appear to regard mercury as absolutely remedial of inflammation, and apply it somewhat indiscriminately and extravagantly, from a too credulous belief of all that has been reported in its praise. And some see nothing remedial in it, and forego its use altogether, because they look for a more exact measure of its benefit in each particular case than it is possible to obtain.

But men of experience surely cannot differ thus widely: I mean that sort of experience which belongs to the subject.

Those who are largely conversant with inflammation in its graver forms,—such as it often appears in hospitals,—and are much engaged in treating it, must have made or witnessed frequent trials of mercury for its cure. And among such, who possess the needful experience, while there would probably be found different degrees of confidence in it as a remedy, none would deny to it all curative power whatever.

Now I venture to offer the following considerations, hoping that they may serve to reconcile in some degree discordant opinions, and to show *how far* and for *what* mercury may be trusted in the treatment of inflammation.

First, then, it is quite certain that mercury is not applicable to all cases of inflammation alike. In some it is eminently remedial; in some less obviously so; and in some it is not remedial at all. Therefore, besides the fact of the inflammation, there must be conditions annexed to it, which aid or insure its efficacy.

What are these conditions? I do not know that I can clearly point them out. But perhaps I can tell you *where* to look for them.

You are to look for them, then, not only in the inflammation itself, but also in the part on which it falls, and in the constitution of the patient.

The condition which respects the inflammation itself is probably contained in its greater tendency to certain results. Now inflammation tends to the deposition of lymph, and to the effusion of serum and of blood, and to suppuration. And all these results are often found to occur equally and in quick succession, or almost simultaneously; but often one or other is the predominant or almost exclusive result. Accordingly, in different cases, inflammation will bear to be called adhesive, or serous, or hæmorrhagic, or suppurative. And the more it is adhesive, or has its tendency to the deposition of lymph, the more does it admit the curative impression of mercury.

That over and above this predominant tendency of the inflammation itself, there is some condition belonging to the nature of the part, which favours the remedial operation of mercury, would seem highly probable. For all experience bears testimony to its more general utility in inflammation of serous than of mucous membranes. In pleurisy, in peritonitis, we are accustomed to give mercury without much discrimination of the kind of inflammation we have to deal with, or whether its predominant tendency be to lymph, or serum, or s, or blood; and success has attended the practice. But in cheal and bronchial inflammation we seldom give it, and yet majority of cases do well without it.

Still there may be a doubt, whether what we ascribe to the rt may not be all included in the nature of the inflammation. r in serous structures its tendency is almost always to deposit nph. In pleurisy and peritonitis, whatever else be found, um, or pus, or blood, it is all involved in false membranes; ereas in mucous structures its tendency is almost always to cus or muco-purulent effusions. But occasionally, although ry rarely, laryngeal, tracheal, and bronchial inflammation s its sole and entire result in the deposition of lymph; and en mercury becomes the remedy upon which we mainly rely its effectual cure. The very exception points rather to the ture of the inflammation than to its seat.

But whatever may be thought of one sort of inflammation ther than another, and of one inflamed part rather than other needing mercury and favouring its effect as a remedy, ere are states of constitution which aid or hinder its curative eration in a remarkable manner.

Now the constitution which bears mercury the best, and ost readily accepts and appropriates all the good it is capable doing, is that which is naturally and habitually the most althy and the most free from all specific taint or weakness, hether hereditary or acquired. When in such a constitution flammation is met with, it commonly arises from accident; t having arisen, it partakes of the nature of the subject. It simple and vigorous, and speeds on rapidly to its destined sults. Inflammation in such a constitution would never be red, if the same strength which sustains the force of the sease did not sustain the greater force (for greater it must be) every counteracting remedy, of bloodletting and of depleting ethods in all their kinds, and especially of mercury.

The constitution which bears mercury the worst, and is ost apt to convert the good it might do into evil, is that which habitually unhealthy, and has acquired or inherited some ecific taint or weakness, as scrofula. When inflammation is et with in such a constitution, it either proceeds from some ight provocation, or arises spontaneously out of the morbid abit of the subject; and having arisen, it still partakes of the

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same as it goes along. Its course is unequal and precarious, not steadily tending to any certain result. All remedies applied to it are of doubtful efficacy. The same weakness which is unequal to carry on the disease cannot sustain the force of simple antiphlogistic remedies, and is especially abhorrent of mercury.

But is mercury to be altogether forbidden as a remedy for inflammation in scrofulous constitutions? I am far from saying so. For even in them I have sometimes seen inflamed organs plainly and palpably rescued from destruction by mercury pushed to salivation.

But then the cases were peculiar. The inflammation had been unnaturally vigorous and rapid for the constitution in which it was found, as if it came from some violent irritation forcing for the time a feeble body into actions (as it were) beyond itself, and enabling it to bear for the time extraordinary remedies, and mercury among the rest. Thus phrenitis, peritonitis, or pleurisy suddenly developed and rapidly progressive, in the most scrofulous subjects, should have the chance of benefit from the mercurial treatment.

These, then, are some of the conditions in the disease itself, in the part it occupies, and in the constitution of the patient, which seem to favour the success of mercury, as a remedy for inflammation.

Further, some little insight has been gained from experience into the mode of its curative operation.

I believe that mercury has two ways by which it contributes to the cure of inflammation. In the one it constrains the morbid energy of the blood-vessels, and counteracts the powers by which the inflammation is carried on. Thus it takes its place in the same rank with bloodletting. In the other, it aids the reparation of parts by promoting the removal of substances foreign to them, whether fluid or solid, which inflammation has produced and left behind. Thus it displays a power different in kind from that of bloodletting, and coming into operation, and having its work to perform, after bloodletting has done all it can. Let us call the first the *antiphlogistic*, and the second the *reparatory*, operation of mercury, and consider each separately.

The purely antiphlogistic power of mercury is displayed ost eminently in the inflammatory diseases of intertropical limates. Here the race is fairly run between the actions and ovements raised within the body by the disease, and the ounter-actions and counter-movements raised by the remedy. he work of destruction by the disease is the work of a day or wo. And the work of a day or two must be the work of ounter-action by the remedy. Even within this time mercury ust be made to salivate, if mercury is made to cure. If the isease outrun the remedy, the patient dies; if the remedy outun the disease the patient is saved. And all that respects the isease, and all that respects the remedy, is so marked, so udden, and so forcible, that physicians neither doubt nor reason bout the matter. They *see* what happens, and resting upon he evidence of what they *see*, they know that the disease is ured by mercury.

Yet hardly more certain is the fact of the cure by mercury, han the manner in which it exercises its curative operation. For, when mercury arrests and cures these frightful inflammaions of the tropics, it is plain that its power is expended upon he *actions* of the disease in controlling them, not upon the effects of the disease in inducing their reparation. The effects, if the disease go on to its effects, are such as admit of no reparation. Organs are found mashed, dissolved, and fallen in pieces, with hardly a trace of their elementary structure left, when the patient dies.

Our knowledge of this purely antiphlogistic power of mercury is new knowledge, almost within our own times. We are indebted for it mainly to our own countrymen practising within the tropics, and a large amount of gratitude is due to them from all mankind.

Now, what mercury could do in India, it was naturally supposed capable of doing in Europe; and experiments were not long wanting to put it to the test.

It was about the time I was a student, that mercury was first greatly talked of and greatly employed as a remedy for acute inflammation in this country. And it has been so talked of and so employed from that time to the present. In the meanwhile experience has been growing; and now, perhaps, the use and amount of its antiphlogistic power are settled as far as they ever can or ever will be.

With us inflammation never, or very rarely, begins and runs on and terminates exactly after the pattern of Indian inflammation. It comes nearest to it, when it puts on its acutest form, and attacks vital organs. And in such inflammation mercury has been administered something after the Indian mode and measure, and has obtained results which display satisfactory proof of its antiphlogistic power. So satisfactory, that, for the sake of this power which they believe it to possess, a majority of the most experienced physicians in England at this day would be found employing mercury and pushing it to salivation in the earliest stages of acute phrenitis, pneumonia, pleurisy, and peritonitis.

If I am told that phrenitis, pneumonia, pleurisy, and peritonitis in their acutest forms have been cured by other means, before mercury was yet known to have an antiphlogistic power, or had ever yet been given with an antiphlogistic aim; that they have been cured by time and copious blood-letting, and so may be cured again; I admit the fact. If I am further told, that the stoutest advocates for the use of mercury dare not leave such cases to mercury alone, but employ it concurrently with blood-letting, I admit the fact.

But questions of practical medicine are not to be settled like points of casuistry. The logical inference from the result of certain cases may incline one way, and the general mass of experience may incline another.

In this, that, and the other case of phrenitis or peritonitis, pneumonia or pleurisy, the patient is largely bled and rapidly salivated, and is quickly well; and in all this perhaps you find no sure warrant for believing that mercury contributed anything to the cure; or, perhaps, you infer confidently that the cure was altogether due to the blood-letting; for in other cases bleeding alone has been employed, and recovery has followed.

Well! as far as *the particular cases* go, I cannot venture to say that your inference is wrong. Still my practice must be governed by the sum of my experience. And the sum of my experience is this, that the acutest forms of these inflammations are arrested more surely and more speedily by bleeding and mercury conjointly than by bleeding alone; and not only more surely and speedily, but by a less loss of blood; in short that mercury does not supersede blood-letting, but that it aids its antiphlogistic power, and yet spares its amount.

Now, in the popular notion, the acutest inflammation is that which displays the greatest power and force of vascular action and the greatest febrile heat, and which works its local changes upon the part affected with the greatest rapidity. Such inflammation we have been contemplating.

But there is inflammation which works its local changes with extreme rapidity, and yet rouses the movements of the general vascular system little, or not at all; nay! even sometimes depresses them, and raises little or no febrile heat. By what name would you characterise this inflammation? As respects its general vascular action and its fever, acute it is not. Yet, as respects its local morbid processes, its effusions of serum, lymph, pus, and its dangerous or destructive disorganisation, acute it is indeed. But, by whatever name you call it, by what remedies would you treat it? If by bleeding at all, it must be by local bleeding, and sparingly and cautiously even by that. There is no great and palpable force of action in the disease, and therefore no great and palpable force of impression needed in the remedies. But there is a destructive disorganising process rapidly at work, which needs to be rapidly overtaken and counteracted. And this (as I well know) is often effected by mercury.

Thus phrenitis and peritonitis, pneumonia and pleurisy are seen to hurry on their destructive processes, making no show of energy and power, and bearing and requiring loss of blood sparingly or not at all; yet curable, and often cured, by mercury.

Now reflect for a while upon what has been said. Here are two forms of acute inflammation, both alike, yet both different, and mercury having a share in the cure of both, but not an equal share. Think what these inflammations are, and *how* mercury is brought to bear upon them, and perhaps you will gain some little insight into the nature of its remedial operation.

In both, the essence of the disease within the part is the me, equally rapid, equally destructive, and tending to iden- cal results; but the accompanying conditions in the con- itution at large are different: in the one great febrile heat nd great excess of vascular action; in the other little or no febrile heat, and a defect rather than excess of vascular action. In the first, there is *the* disease, and much beyond it, the result of sympathy reaching to all the nerves and all the blood-vessels throughout the body. In the second, there is *the* disease and *the disease alone*, carrying on its own essential morbid processes within the part. Blood-letting is a remedy for the first, and sometimes the sole and exclusive remedy. It subdues the high vascular action and febrile heat, and, reaching the disease within the part through the constitution, it subdues it also, and so compasses the entire cure. But while blood-letting is a remedy for the first, it may not be the sole and exclusive remedy. It may subdue high vascular action and febrile heat, and not at all arrest the disease within the part, or it may restrain it a little but not subdue it, and it may need the help of mercury to complete the cure.

Mark then; it is upon the very essence of the disease, upon the essential morbid process within the part, that the remedial power of mercury is brought to bear.

In the second, blood-letting is a less prominent and a less needful remedy, and mercury has a larger, and a more potential and more intelligible share in the cure. For here, too, and here more unquestionably, its remedial operation is, and must be, counteractive of the disease within the part, and of it alone. For the disease within the part is the whole disease.

Well, then, from the share which mercury seems to have in the cure of these two forms of acute inflammation, what is the little insight (for it becomes us to speak modestly in such a matter) to be gained into the nature of its operation as an antiphlogistic remedy? It is this; that, whereas some remedies act upon the heart and pulsating arteries, and so become antiphlogistic by subduing their impulse, or moderating its excess; others upon the nervous system, and so become antiphlogistic by abating irritation and pain; and others act upon glands and upon various organs which secrete, and so become antiphlogistic through derivation or sympathy, mercury acts upon the extreme blood-vessels. And these are the immediate instruments of the disease; and so mercury becomes antiphlogistic by a mode of impression which directly interferes with the inflammatory process itself.

But mercury is reparatory as well as antiphlogistic. Whe inflammation has not been withheld from reaching some of its results, and these have done injury to the structures it has occupied, injury, however, not altogether irreparable or presently destructive of life, then mercury is among the remedies which have power to call into action those wonderful capacities which nature has provided for her greatest need. It now belongs to mercury among other remedies to aid and hasten and render more effectual those operations of the part and the constitution, by which organs are entirely or partially restored to soundness, and life is saved.

When phrenitis has reached hydrocephalus, or peritonitis abdominal effusion; when pneumonia has reached hepatisation, or pleurisy hydrothorax, then mercury is among the remedies which have a power of stimulating the absorbents to remove the matter extraneous to the blood-vessels whether fluid or solid, and so of restoring the diseased structures to the conditions of health. Therefore in this state of things it is high time to give mercury, if it has not been given before; or if mercury has been employed at every previous stage, there is now as much need of it as ever. Whether, pending the inflammation, the chance of benefit, from the antiphlogistic power of mercury has been thrown away, or whether it has been made the most of, and has not succeeded, there is its reparatory power still to look to, which may make up for the fault of our practice in the one case, and the failure of our practice in the other.

But as, with its antiphlogistic power, mercury has sometimes a smaller and sometimes a larger share in the cure of inflammation; so, with its reparatory power, it has sometimes many auxiliaries, and is sometimes itself almost all in all. There are cases in which, under the use of purgatives and diuretics and counter-irritants, the effused serum or lymph is daily becoming less and less; and when salivation arrives it is difficult to determine how much mercury contributes to insure or complete the reparation which had already begun, and proceeded to a certain point. And, again, there are cases in which serum and lymph abide undiminished in cavities, on surfaces, and among interstitial textures, in spite of many remedies; yet no sooner does salivation appear than they forthwith begin to be absorbed, and continue to be absorbed rapidly until they are entirely gone.

This distinction between the antiphlogistic and reparatory powers and operations of mercury is simple, and intelligible, and (I believe) true. It has not been plainly stated, but it has been plainly acknowledged by the common practice of medical men, and confirmed by their experience. I am sure it will be usefully borne in mind. For there are no conditions more essential to the success of our practice than these; namely, first to understand the purposes which a remedy is able to fulfil, be they few or be they many, and then to have clearly in view those for which it is needed in the particular case, and then steadily to point it and press it to its mark.

But, though they may be distinct in kind, it is not always easy to determine where the antiphlogistic operation of mercury ends, and its reparatory operation begins. And truly they are often both required and both displayed in the same case. Where mercury is needed and given to abate or arrest inflammation in its earliest and most active stages, it is commonly still needed and still given in its decline. The best and most efficient treatment of inflammation is seldom so absolutely successful, but that something is left for reparation before the organ can be said to have acquired its perfect soundness.

LECTURE XIV.

UBJECT CONTINUED.—ANTIPHLOGISTIC AND REPARATORY POWER OF MERCURY OVER ACUTE INFLAMMATION FURTHER ILLUSTRATED BY ITS EFFECTS IN IRITIS, OVER CHRONIC INFLAMMATION BY ITS EFFECTS IN RHEUMATIC OPHTHALMIA.—ITS EFFECTS UPON INTERNAL CHRONIC INFLAMMATION.—OUR ASSURANCE OF THE SEAT IS GENERALLY GREATER THAN IT IS OF THE ESSENCE OF INTERNAL CHRONIC DISEASES.—OUR CONCLUSIONS, THEREFORE, LESS CONFIDENT RESPECTING THE EFFECTS OF MEDICINE UPON THEM.—EXPERIENCE OF THE CURATIVE EFFECTS OF MERCURY IN MANY HIDDEN DISEASES, WHICH FROM CIRCUMSTANCES ARE DEEMED INFLAMMATORY.—NOTICE OF A PRINCIPLE TO BE REGARDED IN THE MODE OF ADMINISTERING IT.

ALL that has been said of the uses of mercury, both as an
antiphlogistic and a reparatory remedy, will be found to have
its best illustration in the inflammatory diseases of one par-
icular organ. And that organ is the eye. And if any of you
ave imbibed an unlucky scepticism respecting the curative
owers which belong to mercury, a month's diligent attend-
ice and observation at the Eye Infirmary will be sure to
sabuse you of it. The eye might have been intended to
rnish us a little model for studying processes of disease and
ocesses of reparation as they go on in all parts of the body,
admirably does it answer this purpose.

In the eye we may behold the miniature of all diseases; for
re nature has displayed, as in a glass, all the little intimate
tails of her own wonder-working powers; her modes of dis-
ganising, and her modes of repairing; and the aids which
e receives, and the impediments which she sustains, from the
ght and wrong application of medical agents.

Let us take the iris, its inflammations, and their cure, and
vell upon them for a while. There are cases of iritis in which

the entire cure is achieved by blood-letting alone. The fact cannot be denied. But such cases are rare. And there are cases in which the entire cure has been compassed by mercury alone. Neither can this fact be denied. But such cases likewise are rare. The vast majority of cases which have terminated in a restoration of the organ to its perfect structure and functions have been treated by both. Experience is so decisive upon this point, that it would be morally wrong to come to the treatment of any particular case with the purpose of trusting exclusively to either.

Truly there is enough for both to do. And with a little attention you may see clearly what it is that each really does, and may apportion to one and the other the exact share that belongs to it in bringing about the result.

Now blood-letting and mercury have not the same relative share of the cure in all cases. In one, blood-letting has a very large share, and mercury a very small one; and in another, the two remedies have their proportionate shares inverted; while in neither case could either of the remedies be dispensed with.

In very acute iritis where, besides the iris being discoloured and covered or studded with lymph, and besides the irregular pupil and the vascular zone around the cornea, the sclerotic is streaked with blood-vessels and the conjunctiva is as though injected with vermilion, blood-letting is demanded; even venæsection, if the pulse be hard and full, and cupping upon the temples, if it be not.

And how much does the blood-letting in such a form of iritis usually effect? It changes the general aspect of the eye. It empties the blood-vessels of the sclerotic and conjunctiva. All that was vividly red beyond the margin of the cornea becomes paler. But all within this limit remains the same; the zone round the cornea, the lymph upon the iris, and its discoloration, and the irregular pupil all remain the same. Blood-letting has abated or subdued the inflammation so far as it has exceeded the bounds which essentially belong to it as an iritis. But within those bounds it has not reached it remedially in the smallest degree. Within those bounds, in spite of the blood-letting, the inflammation is still proceeding uninterruptedly to its results. The points of lymph go on enlarging themselves into masses, which more and more fill the anterior chamber, and close the pupil, and more and more involve iris, and cornea, and crystalline lens in one indiscriminate disorganisation.

But add the use of mercury to blood-letting in the treatment of iritis in this, its acutest form; and, besides a visible emptying of blood-vessels in the entire organ, there will, as soon as salivation arises, be a visible change in the condition of parts within the proper sphere of the inflammation. Whatever stage the inflammation has reached, there it will pause. Then the cluster of blood-vessels, which tended to the margin of the cornea, will become paler and paler, and the vascular zone will be seen to fade, and the drops of lymph which studded the surface of the iris will cease to increase, and then begin to lessen, and then gradually disappear. In the mean time, the aqueous humour becomes clearer; the pupil, which was rendered irregular by partial adhesions, recovers its circular form, and vision is perfectly restored.

But in iritis, when the general aspect of the eye is not vividly red, and when the general vascular system is not roused into fever, and there is no hardness of the pulse, and yet, nevertheless, within its own specific limits, the inflammation is carrying on its own essential processes actively, rapidly, and destructively, and the zone encircles the cornea, and the iris is covered or studded with lymph, which is daily becoming more and more, and the pupil is irregular or fixed; then there is small need of blood-letting, and only of local blood-letting at most; but the need of mercury is as great as ever. We cup or we apply leeches; and the good that we thus do is seldom immediately apparent. It is not until the mouth becomes sore, that any visible change begins in the conditions of the disease.

Here, whatever may be due to cupping or leeches, observation cannot be wrong in assigning the larger and more appreciable share of the cure to mercury.

Such is the strong testimony which practical experience can furnish to the antiphlogistic and reparatory powers of mercury, when it is brought to bear upon *acute* inflammation. By *acute* inflammation, I mean that which carries on its disorganising processes *rapidly*, and which works manifest change and detriment within the structure of parts from day to day, whether it be accompanied by much excess of action in the vascular system at large, and much febrile heat, or by little or none at all.

But mercury is capable of an antiphlogistic and reparatory impression upon *chronic* inflammation. By chronic inflammation, I mean that which carries on its disorganising processes so slowly that the amount of change and injury it does to the structure of parts is not appreciable from day to day. It is also the characteristic of this inflammation to abide long in one stage before it passes on to another.

Now this general tardiness of its progress, and this lingering in its several stages, give leisure and opportunity for learning the effects of remedies upon it. Thus, some remedies are found to act curatively in one stage rather than another, and others to act curatively alike in several. Among the last is mercury. When chronic inflammation abides long in the stage of mere vascular repletion, mercury will often arrest it there, so that it shall finally cease before it has proceeded to effuse serum or lymph. In those forms of ophthalmia called rheumatic, the special redness of the sclerotic and the vascular zone, and the general redness of the conjunctiva, after they have long existed together with their characteristic pain, and have long refused to yield to other remedies, have often gradually yielded to mercury, producing salivation.

And in the same forms of inflammation, now advanced to a more onward stage, the hazy cornea, and the turbid aqueous humour, and the discoloured iris, and the irregular pupil, have been gradually cleared up, and been restored, as the mouth has been gradually made sore by mercury.

But in the whole range of diseases, the cases are few in which we can gain sensible demonstration of what is going on within the part. Most frequently we are obliged to reason and to calculate and learn from the manner in which function and sensation are effected, what is the part, and what is the disease, and what is the fittest remedy. Yet, without doubt, the little that falls within the reach of the senses, is the best and readiest help to much more that lies beyond them. Thus the visible forms of chronic inflammation, and their visible cure by mercury, exemplified in the eye, suggest what many forms of unseen chronic inflammation are likely to be, and the probable success of mercury for their cure. Accordingly mercury has come to have a frequent place among the remedies of such inflammation when it is believed to exist.

Still to draw our instances from the eye, vision is often lost, or impaired in various degrees, where we do not discern the actual disease, but believe it to be seated in the optic nerve or the retina, and where, from circumstances attending the loss or impairment of vision, we conceive the disease of the retina or optic nerve to be chronic inflammation, or some of its effects. This notion of the disease at once points out the remedy. And it is remarkable in what numerous instances of amaurosis vision has been gradually restored by mercury pushed to salivation. The success of the remedy plainly denotes the nature of the disease. In many such affections medicine would be absolutely without resource but for mercury.

But to draw our instances from other organs, there are numerous affections of the limbs in which sensation or voluntary motion, or both, are perverted, impaired, or lost; and numerous mental affections, in which intellect and moral perception are disturbed, or injured, or annulled. The disease, without doubt, is in the spinal marrow, or in the brain. But of what kind is it? Often the history of the patient will tell us something, his habits, his mode of living, or injuries, accidents, and by-gone complaints which have befallen him; and often the history of his symptoms will tell us more,—how they began, and how they have proceeded hitherto, and what has done good and what has done harm; and all these together may point strongly to chronic inflammation. And happily this chronic inflammation may be still lingering in some stage short of that disorganisation which is destructive and irreparable.

Upon these fair presumptions the treatment has been instituted, and mercury has been employed among other remedies, and salivation has been gradually produced and long maintained; whereupon the symptoms have gradually cleared up and finally disappeared altogether.

Many of the most satisfactory examples which I have seen of the curative powers of mercury, have been furnished by these forms of disease, in which I considered that I had chronic inflammation to deal with.

But let me be very careful of misleading you. Very many have been the instances in which I have seen mercury utterly fail to exercise any curative impression whatever, where the presumption of chronic inflammation has been as strong as possible, and where the fact has been put beyond a doubt by examination after death.

The truth is, that chronic inflammation, in organs remote from observation, often proceeds so much by degrees and so covertly, as to give no intelligible notice of itself, until it has already reached results which are irreparable. The steps and stages of chronic inflammation are not to be distinctly traced and calculated except by the eye.

Again, very many have been the instances in which the treatment by mercury and other antiphlogistic remedies has not succeeded for the cure of supposed chronic inflammation; because, in fact, no such inflammation has existed, but some other disease, in its own nature incurable.

Now when a disease is thus taken and treated for inflammation, and turns out to be no such thing, and taken and treated for curable, and turns out to be incurable, there is ignorance no doubt on our part, or there is mistake, and some may think there is blame. But it is such ignorance as must be, such mistake as cannot be helped, such blame as the best and wisest of us all have no power of escaping. From the nature of things it cannot be otherwise.

There were at the same time under my care in the hospital, two men completely paraplegic. Both had lost sensation and voluntary motion of the lower extremities by slow degrees. This was all that could be said of their symptoms. In neither of them was there any fever, or vascular excitement or pain. From the account which they gave of themselves, there was reason to believe that the disease of both had originated in exposure to cold some weeks ago, and that that disease was chronic inflammation of the spinal marrow, or its coverings.

Both were treated by the same remedies, by counter-irritants to the spine, and by mercury. In both, salivation was gradually induced, and was long maintained.

Well, what were the results? One patient, as soon as the mercury gave notice of its specific effect upon the constitution, showed an earnest of improvement. Sensation and the power of motion returned very slowly, but at last very completely, to his limbs, and after three months he walked out of the hospital well. The other never showed the least sign of improvement, and, after lingering in the hospital for many months, he died. Upon examination a small scrofulous tumour was found growing from the theca, and pressing upon the spinal marrow.

Now I can fancy an uninformed looker-on coming to a very unjust judgment upon these results, and giving a very unjust award of praise and blame accordingly; applauding what he might take for a clear insight into the nature of the disease in the one case, and the consequent success of its treatment, and censuring what he might take for ignorance and mistake, and consequent failure, in the other. But there is neither praise nor blame in the matter. You cannot be sure of the success of your remedy, while you are still uncertain of the nature of the disease, as you must be here.

The diagnosis of disease is often easy, often difficult, and often impossible. Why it is so, would be a most interesting and profitable inquiry; but a very large one too, much too large for us at present. But I must just touch upon one part of it (the part which here concerns us), and try to show how it happens that the diagnosis of disease is often absolutely impossible.

All diseases are known by their symptoms; and all symptoms may be regarded under two general aspects, viz. those which denote the disease in its essence, and those which denote the disease in its seat. Thus, inflammation has symptoms arising out of itself as such, which denote it to be an inflammation; and it has symptoms arising out of the disturbed functions of the organ it occupies, which denote what that organ is, as the brain, the lungs, the heart, the stomach.

Now, in proportion as inflammation is more acute and rapid, both orders of symptoms are more express and prominent, and the diagnosis both of what is the disease, and of what is its seat, is equally certain. But in proportion as inflammation is more chronic and tardy, the symptoms which flow from its essence are less and less marked; they may even become indiscernible, so that they cannot be said to exist at all. And then the diagnosis of what the disease is, becomes necessarily more and more obscure, and may be so obscure as to amount to no diagnosis at all. Yet in the mean time the symptoms which flow from the part are distinct enough, and become more and more distinct from week to week; and thus, while a very obscure diagnosis of the nature of the disease is all that can be obtained, or no diagnosis at all, the diagnosis of its seat is clear and undoubted from first to last.

There is, then, a hard necessity in the case, and there is no help for us; while of the organ affected we are certain, at the nature of the disease we can only guess. Yet in so guessing, surely we ought to be led by our hopes, and by the possibilities of doing good. We should always presume the disease to be curable until its own nature prove it otherwise.

But when the question is of chronic disease affecting the structure of parts, to presume that it is curable is tantamount to presuming that it is simply inflammatory; and this at once suggests the use of mercury.

Now, I once heard an old experienced physician say, that most of the obscure diseases were cured by mercury. This is as much as to say that most of the obscure diseases are of the nature of chronic inflammation. It would perhaps be nearer the truth to say "many," instead of "most," and this would still leave sufficient encouragement for the employment of mercury.

But one point yet remains to be well considered. I have spoken already, as we went along, of mercury so given in one case as to produce salivation rapidly or at once, and so given in another case, as to produce salivation slowly or gradually. But, if salivation do but take place, does it matter much to the cure whether it arise sooner or later? Yes! indeed does it. And this is the very point now to be considered. It is as important as any to be found in the whole of practical medicine.

Mercury, as a remedy for inflammation, requires to be administered with as careful an adaptation of its dose to the exigencies of each particular case, as bleeding does of its mode and quantity. The principle of practice is this, to measure the force and rate of the counteractive impression to be produced, whether by blood-letting or by mercury, by the force and rate of the disease. If you have an inflammation of the greatest force and greatest rapidity to deal with, and organic changes are taking place from hour to hour, and blood-letting is to be your remedy, its mode must be by venæsection, and its quantity must be of large amount; and it may need to be repeated again and again, and at short intervals. The blood-letting must make itself felt with a force and a rapidity which shall exceed the force and rapidity of the disease, otherwise it is no remedy at all. So, too, in the same conditions of inflammation, if mercury is to be your remedy, its dose must be large, and repeated. Calomel must be given in the dose of half a scruple at once, and again after six or eight hours. The patient's life may depend upon his being salivated within a couple of days. The mercury, like the blood-letting, must make itself felt, by its specific effects, more forcibly and more rapidly than the disease, otherwise it will fail of its counteractive operation.

But if the inflammation be of little force, and slow in its progress, and its organic changes such as are not visible from hour to hour, or even from day to day, but rather from week to week, then if your remedy be blood-letting, its mode must not be by venæsection, but by cupping or leeches, and its quantity must be small, and, if it be repeated, it must be at more distant intervals. For now it is essential to the cure that the counter-impression of the blood-letting should be kept down to the small measure of power, and the slow rate of progress, belonging to the inflammation; otherwise it is no remedy at all. And in like manner, if mercury be your remedy, it must now be given more sparingly and less frequently. The object is to produce salivation, not as soon as possible, but slowly and without surprise or violence. A grain or two of calomel once or twice a day, or even some milder preparation of mercury, will bring its specific effects to bear upon the disease after many days, but still remedially.

Upon the principle here laid down and illustrated by the use of bleeding, as it is the important principle which is also to guide us when we employ mercury for the cure of inflammation, let me say a few words more.

Partly, I think, this principle would be at once accepted as true, and partly it would seem questionable at first sight, and would need experience to confirm it. That the blood-letting must be copious, and of the most general kind, and that the doses of mercury must be large, which are to be counteractive of severe and rapid inflammation, may be easily conceived. It looks as if it necessarily must be so. But that the blood-letting *must be* scanty, and of that kind which is local, and that the doses of mercury must be small, which are to be counteractive of the inflammation that proceeds slowly, and is of small power, would hardly be expected. One should rather be disposed to argue *à fortiori*, that copious blood-letting by venæsection and large doses of mercury, being able to cure inflammation of great force and rapidity, could not fail to obtain an easy mastery over that which is of little force, and proceeds tardily: that small bleedings and small doses might now be enough, and yet that large ones would do the business more summarily and at once. But experience comes in to rectify such calculations, teaching us this general fact, that small bleedings and small doses of mercury are undeniably curative in forms of inflammation, where large bleedings and large doses exercise no remedial power whatever. A large venæsection will (as it were) leap over the disease without touching it, and afterwards a few leeches will bring it safely and gradually to an end. A rapid salivation will pass by the disease, and leave it unaltered. But when this salivation has been allowed to wear itself out, and the constitution been left to forget (as it were) the impression, and to recover from it, then the remedy being resumed on other terms, and administered in very small and very cautious doses, has wrought, in process of time, an easy and effectual cure.*

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* I think it well here to subjoin in a note certain remarks upon conditions favourable or essential to the remedial effects of mercury, which I made many years ago, when an opportunity had been recently afforded me of watching its operation upon a pretty extensive scale:—

"As in regard to the various bowel complaints, so in regard to the various nervous disorders, the condition most essential to the success of the remedy was unquestionably this, that the force and rate of its impression should be in proportion to the force and rate of the disease. And the chief object of our care was to preserve that proportion.

"Thus, where the disease was less severe, and was slow in its progress, salivation (without reference to its degree) was to be procured gradually; where the disease was more severe and rapid in its progress, salivation (without reference to its degree) was to be procured at once. Headache and vertigo, which had come on tardily, and had abided many weeks, without any perceptible excitement of the circulation, were to be made to yield under the slow and alterative influence of mercury, which the constitution could bear without injury. Headache and vertigo, which had been sudden in their accession, were accompanied with excitement of the circulation, and already seemed to threaten something beyond themselves, as convulsion, or delirium, or frenzy, were to be at once mastered by such a sudden and powerful impression of the remedy as the constitution would severely feel. Hence the quantity of the remedy was continually varied, according to the exigencies of particular cases. For some we prescribed one grain or two grains of mel, with a small quantity of opium, once or twice in twenty-four hours, thus succeeded in procuring relief after the lapse of a week or ten days; ng no harm in the mean time, to the general health and sensations of the ient. For others, we prescribed five, or ten, or even twenty grains of omel, with proportionate quantities of opium, once, or even twice, in nty-four hours ; and thus succeeded in dissipating the symptoms at once, in rescuing life at the expense of some present injury to the constitution." An Account of the Disease lately prevalent at the General Penitentiary, 113, ed. 1825.

LECTURE XV.

USE OF MERCURY IN THE TREATMENT OF RHEUMATIC ENDOCARDITIS AND PERICARDITIS.—EVERY GREAT ADVANCE OF CLINICAL AND PATHOLOGICAL KNOWLEDGE REQUIRES THAT OLD REMEDIES SHOULD UNDERGO THE TRIAL OF NEW EXPERIMENTS.—IN ENDOCARDITIS THE REMEDIAL POWER OF MERCURY SHOWN, NOT SO MUCH BY THE RESULT OF SINGLE CASES, AS BY THE COMPARATIVE RESULTS OF MANY WHICH HAVE, AND OF MANY WHICH HAVE NOT, BEEN TREATED BY IT.—IN PERICARDITIS ITS REMEDIAL POWER MAY BE APPRECIATED IN INDIVIDUAL CASES.—THE RELATION WHICH THE CESSATION OF THE EXOCARDIAL MURMUR BEARS TO THE CESSATION OF THE DISEASE.—THE POWER OF MERCURY TO PROCURE THE CESSATION OF THE MURMUR, EARLY OR LATE, ACCORDING TO CIRCUMSTANCES.—EARLY SALIVATION MOST STRIKINGLY CURATIVE.—LATE SALIVATION NOT WITHOUT BENEFIT.—COMPARISON OF SOME GENERAL RESULTS.

WHILE we were considering the treatment of rheumatic inflammations of the heart at each several step, and with the recommendation of each several remedy, I kept your attention alive to another remedy, which was yet to be noticed. This is mercury. Bleeding, in its various forms, must be used, I told you, for its own direct curative power over the disease; but *so* used, that it should not hinder the curative power of mercury. Opium, I told you, must be employed to pacify the nervous system; but *so* employed, moreover, that it should at the same time aid the curative power of mercury. Then the curative power of mercury over inflammation in general was considered; and now we come at last to its curative power over rheumatic inflammations of the heart, and I will endeavour to give you as fair an estimate of it as I can.

Many years ago, in certain Essays which I published "On some Diseases of the Heart,"* I ventured to insist, that mercury pushed to salivation was indispensable to the cure of pericarditis. And at that time I did not insist on less than the results of my experience, carefully considered, seemed to warrant. But then my knowledge of the disease was very defective; defective especially in respect of its diagnosis during the life of the patient; and so was then every body's knowledge. For now I plainly perceive that the majority of the cases in which I then believed myself treating an inflammation of the pericardium, were, in fact, cases of endocarditis.

As diseases are better understood, and we possess surer signs for discerning their seat and progress, and events, the records of past experience become obsolete, and so a necessity arises for a new course of clinical observations. Even each man's own stock of observations, if in his time knowledge has made a great step in advance, observations which he has carefully kept in mind, and which have served him to draw conclusions from, he may, after all, have good reason to distrust.

What an amazing difference there appears in the objects of nature around us, according to the point of view from which we regard them! When we stand on the right spot for taking in the whole prospect, we then see what before we could not see at all, or we then see clearly what before we only caught a glimpse of, from some less commanding position.

Thus, the point of view from which diseases of the heart are now regarded, discloses so many new things, and puts so many old things in a much clearer light, that I distrust the results of my former experience, and feel the need of submitting all my practice, and the use of all my remedies, to the test of my own more recent observations. I feel that the use of mercury, especially, requires to be brought to this test.

Formerly I gave mercury, or designed to give it, in every case of pericarditis, and sought to procure salivation, which I deemed indispensable to the cure. And thus thinking to give it in every case of pericarditis, I probably gave it also in every case of endocarditis, not being then able to distinguish one from the other. But now, when I look back, I plainly perceive (whatever I might then have thought), that the impossibility of then forming a diagnosis between the two stood in the way of my gaining a sure proof of the benefit of mercury in either. The diagnosis, however, between the two, being now plain and obvious, I will seek the evidence of the use of mercury in the treatment of each separately.

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* Med. Gazette, vol. iii.

And first, of endocarditis.

In my clinical records, I find some cases of endocarditis in which bleeding and common antiphlogistic remedies alone were employed, and not a grain of mercury was given; and yet all the symptoms referable to the heart, the pain, the palpitation, the dyspnœa, and the endocardial murmur itself, entirely ceased. In short, there was all the evidence that could be required of a perfect cure. But I find no cases in which mercury alone was given, and not a drop of blood was taken, and no other antiphlogistic remedy was employed, and yet perfect reparation followed. While, then, I have facts which claim an independent remedial power for blood-letting, I have none which claim the same for mercury.

Again, I find some cases of endocarditis in which bleeding was used, and mercury given conjointly, and the evidence of cure was satisfactory; but the mercury produced no salivation. Here one cannot tell what share the mercury had in procuring the result; one cannot even be sure that it had any share at all.

Again, I find some cases in which bleeding and mercury were employed conjointly, and salivation quickly followed, and every vestige of the disease was swept away at once. But here, the modes in which the remedies took effect, and the symptoms ceased, were such, that no opinion could be formed how much of the cure was due to bleeding, and how much, if any part of it at all, was due to the mercury.

Again, I find some cases in which bleeding and mercury were employed conjointly, and salivation followed, but it was slow to arrive. And reparation was complete in the end, but it was after a long time. Here the manner and gradations by which the disease declined appeared to correspond with the sensible operations of the remedies, and to denote, with seeming exactness, the curative influence belonging to each. The bleeding was practised, whereupon vascular action immediately abated much of its force, and pain, and palpitation, and dyspnœa immediately went away, but the endocardial murmur remained.

Mercury, too, was given from the first, and day after day it was still given, yet there was no salivation. At length, however, salivation arose, whereupon the endocardial murmur ceased.

These several orders of cases exhibit fair specimens of the sort of difficulties which are apt to obstruct us, when we seek to analyse the effects of medicines. We may be well satisfied with the general results of treatment; but when we betake ourselves to calculate the separate value of the means by which these results are brought to pass, we may not be able punctually to determine what it is.

If I were called upon to bring sure proof of the remedial power of mercury in endocarditis, the last, perhaps, are the only cases to which I should be allowed to appeal; and these claim for it (what I have explained to be) a reparatory, not an antiphlogistic power. They do not satisfy us that it had any thing to do in counteracting the progress of the inflammation. They only show us that it came in aid of nature in restoring the endocardium to its integrity, after the inflammation had ceased.

But although in endocarditis I cannot produce proof, beyond cavil and exception, of more than a reparatory power belonging to mercury, yet my impression is so strong that it does exercise, moreover, a power purely antiphlogistic and auxiliary to blood-letting, that I dare not omit to give it in every case as soon as I have ascertained the nature of the disease, and to press it to salivation.

Analogy favours the belief of its being antiphlogistic as well as reparatory in inflammation of the endocardium. It is obviously so in inflammation of some other structures—of the iris, for instance.

At all events, the *reparatory* power of mercury in endocarditis is tolerably certain, and the earlier we employ it, the more likely is this reparatory power to come into effectual exercise. Mercury being administered coincidently with the use of blood-letting and other remedies, though it may possibly not add any antiphlogistic power of its own to theirs, yet in the mean time it will be making its way in the constitution, and will be ready to further the work of reparation when the inflammation has passed away.

Thus, when I take my own experience in detail, and examine the results of treatment case by case, I cannot pretend to have found a certain proof that mercury is an indispensable remedy to the cure of endocarditis. But taking my experience in the mass, I still fear to omit its employment in any case of endocarditis with which I have to do.

No doubt, by bleeding and other ordinary antiphlogistic remedies, præcordial pain and palpitation, and even the endocardial murmur, have been known entirely to disappear, when mercury has either not been used at all, or being used has not produced salivation.

But against the particular result of these cases, as seeming to exclude mercury, I would set the general result of my entire experience, as seeming (to me at least) to recommend it. Since the time that auscultation has disclosed the sure diagnosis of the disease, it has not in a single instance proved fatal under my care. But M. Bouillaud, to whom the world is greatly indebted for bringing its diagnosis to perfection, records numerous instances in which endocarditis terminated fatally under his management.

Now M. Bouillaud's treatment of endocarditis has always been vigorously antiphlogistic. He has employed large and repeated bleedings, and all other remedies calculated to control inflammation, except mercury. Mercury he never used.

My treatment of endocarditis, on the other hand, has not been vigorously antiphlogistic. I have seldom employed venæsection at all, and never largely. But mercury has been among my remedies in almost every case.

From this comparison the conclusion is irresistible, that mercury has the power of doing something more in counteraction of inflammation of the endocardium than venæsection and other antiphlogistic remedies, and that upon this something being done the life of the patient often depends.

What this something is we can only conjecture from analogy, but yet with great probability of truth. Undoubtedly it consists either in controlling the disease, or in restoring the conditions of health, or in both. For these are the only ways, as far as I know, in which mercury exercises its curative influence.

Experience thus testifies to the broad fact of mercury bein instrumental *to the saving of life* in endocarditis. And unquestionably so it may be, and yet not carry its curative powers to perfection in every case. From the records already given, it will be seen how many subjects of endocarditis are brought through a formidable disease by antiphlogistic and mercurial treatment, and survive and are safe; but still they have the endocardial murmur, and never lose it. Here the mercury has indeed fallen short of restoring perfect integrity of structure, but it has had its share in saving life nevertheless. Some unevenness, some thickening, puckering, or shortening of a valve, or a bead of lymph upon it; this may be all that remains. But this is enough to produce an eddy of the blood, and the eddy to produce an audible murmur, and thus the heart ever afterwards passes for unsound. Yet any other internal organ which, from being inflamed, should come so near reparation, would pass for sound, because we should not have the means of knowing it to be otherwise.

In those diseases where the remedial power of mercury is least questionable, reparation is apt to take place, leaving behind a mark or a scar. Thus, the pupil often remains slightly irregular after the cure of iritis, and clefts remain in the tonsils after the cure of an ulcer. No evil, however, results. But the merest scar within the heart is, from the nature of its functions, a grave matter in its ultimate effects. Still it is no disparagement of the remedial powers of mercury here, more than elsewhere.

In conclusion, the simple fact of the much larger proportion of cases in which life is saved where mercury is used than where it is not, is a plain paramount recommendation of it as a remedy for endocarditis, which all can see and understand.

We come next to the use of mercury in pericarditis. In every one of my eighteen cases, complicated and uncomplicated, mercury was employed. But then it was employed conjointly with other remedies; so that my experience does not furnish me with a single case from which I should be allowed to infer conclusively the curative effect of mercury without the aid of other remedies, or the curative effect of other remedies without the aid of mercury. Still I should be sorry to omit the use of either in any case of pericarditis with which I had to do. But the question at present is only concerning mercury. And, allowing bleeding and common antiphlogistic measures to be needful, and even indispensable, I am fully persuaded that let them do all which they can do, mercury can do something more; something towards saving life and inducing reparation, which nothing else can do, or nothing else can do so well. Of this there is as satisfactory evidence as we have of most points in practical medicine which are thought settled.

Before I come to a closer examination of this evidence, I would mention one remarkable fact. Of the eighteen cases of pericarditis, which are the subject of our present commentary, and were treated by mercury, some were brought under its sensible influence very largely, and some very slightly, but all in a certain degree except two. In these two cases, though mercury was given in large quantity and for a long period, yet was there no sensible ptyalism, no fœtor of the breath, no complaint of soreness of the gums. In these two cases, while mercury was pushed thus strenuously, other remedies were vigorously employed; and, moreover, in these two cases every conceivable circumstance was present which could promise success to medical treatment. The subjects were healthy subjects and in the prime of life. The disease (there was reason to believe) was detected as soon as it arose. Not a moment was lost in the application of remedies. They were venæsection and cupping and leeches and blisters and opium and, from first to last, mercury. But the mercury, as I said, did not produce the peculiar effects of mercury in the slightest appreciable degree.

Now of my eighteen cases of pericarditis I lost three; and these were two of them.

But let us see whether we cannot get a little nearer insight into what mercury does in pericarditis. And let me premise that in pericarditis the symptoms, both auscultatory and non-auscultatory, give a more exact intelligence of what is going on from day to day than they do in endocarditis; and we are able to follow the steps of the disease, and to appreciate the effects of remedies, more surely and satisfactorily. And, as of other remedies, so of mercury.

Now my strong impression is, that pericarditis, of that extent and degree which it generally reaches in acute rheumatism, though it be treated by the best remedies and in the most opportune and efficient manner, is never so completely cured that the parts regain their perfect integrity of structure; in short, that in the most favourable event the pericardium almost always adheres. Medical treatment saves life, but it rarely prevents the adhesion.

But then, has the medical treatment of pericarditis no further aim than barely to save life? Has it only to provide that the exocardial murmur should cease, and the patient continue to live on any terms? Yes! it seeks much more than this. It has, indeed, first to save life; and it has further to provide that the life which it saves shall go on with the least possible hindrance, and suffer the least possible abridgment of its natural duration. And this it does when it arrests the progress of the disease, and, moreover, provides that the reparation (which I fear is rarely perfect) should take place with the least possible degree of imperfection; that is, that the folds of the pericardium should be brought together again, and should permanently adhere with the least possible quantity of intervening lymph.

When this is brought to pass, remedies have done their best. But, for the sake of being able to judge how far remedies are actually doing their best in particular cases, we should bear in mind, that the final cessation of the exocardial murmur probably denotes the adhesion of the pericardium, and that the sooner this occurs the less accumulation of the products of inflammation must have preceded it, and the more perfect, or, rather, the less imperfect, is reparation likely to be in the end.

Thus it is a great thing for the exocardial murmur to begin and cease in a week. I can refer to three cases only, in which I am sure that such was the fact. And there was not one of them in which the patient was not first salivated. In two other cases the exocardial murmur ceased, in one on the sixth, and in the other on the eighth day, after they were brought under my observation and treatment, and in both, the patients were first salivated; but in them I had no certain knowledge how long the murmur had been audible before admission into the hospital. In these several cases not only did the murmur cease, but the whole business of medical treatment was accomplished. With the cessation of the murmur life was apparently safe, and convalescence followed rapidly.

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Here mercury seemed to me to display its highest antiphlogistic power. But, if others doubt, let it be a question for future observation, whether, where the murmur of pericarditis rapidly ceases and the danger rapidly disappears and convalescence rapidly follows, salivation is or is not a preceding condition, in all, or in the vast majority of cases. There is no question of practical medicine more important to have rightly settled.

But I am anxious not to be misunderstood in this matter, or thought to state either more or less than I mean. My experience (as far as it goes) tells me, that whenever the exocardial murmur has ceased early, salivation has first taken place. But it does not affirm the converse, viz. that wherever salivation has taken place early, the exocardial murmur has ceased early. These are very different things. The early cure *may not* take place without the early salivation, but the early salivation *may* take place without the early cure.

When, therefore, in after times, you come to treat this disease, should you succeed in bringing your patients speedily under the influence of mercury, and find in one case a speedy cessation of the murmur and a speedy arrest of all the more formidable symptoms, and find in another case the murmur still remain and still abide for a long time afterwards, and other formidable symptoms, mitigated indeed, but more slow to disappear, do not say that I have misrepresented the power of the remedy. All this is according to my experience; for turning to my records of cases I find six in which salivation was rapidly produced, with the following different results as to the period at which the murmur ceased:—

Cases.		Days.		Days.
1st.	Salivation produced in	1	Murmur ceased in	4.
2d.	—	2	—	7.
3d.	—	3	—	4.
4th.	—	4	—	28.
5th.	—	5	—	14.
6th.	—	5	—	25.

Of these six cases mercury was most eminently remedial in the three first, less eminently but still remedial in the three last. The cessation of the exocardial murmur at such widely different periods after salivation appeared, is satisfactorily accounted for by the circumstances of the different cases.

In the three first cases mercury was given as soon as the murmur was audible, and salivation followed in one, two and in three days; and the entire duration of the murmur was four days in the first, seven days in the second, and four days in the third case. Here there was reason to believe that the murmur denoted the commencement of the disease. The patients were under observation before the murmur arose. Prior to it there was no other symptom referable to the heart; and thus the remedy had an equal start with the disease. It was ready to sway and counteract the first inflammatory movement, and still to keep it under day by day, and ultimately to withhold it from terminating in more than a scanty effusion of lymph within the pericardium. Thus, when the inflammation ceased (as it did) quickly, reparation was short and easy; there was little effused, and little to be absorbed. The folds of the pericardium soon came together again, and were soon restored to their previous state, or soon adhered.

In the three last cases, too, mercury was given as soon as the murmur was audible, and salivation followed in four, in five, and in five days. But the entire duration of the murmur was twenty-eight and fourteen, and twenty-five days in each case respectively. Here there was reason to believe that the murmur did not denote the commencement of the disease. Prior to it for some days, and before the patients came under our observation, there were other symptoms referable to the heart,—severe pain and anguish and inordinate impulse. And thus the disease had the start of the remedy. The inflammation was at first, and still for a while, unchecked and uncounteracted, and ultimately was not withheld from terminating in a large effusion of lymph and serum within the pericardium; and thus, when it ceased, reparation became long and difficult. There was much effused and much to be absorbed. The folds of the pericardium were slow to come together again and slow to adhere. When acute inflammation has existed only for a day or two, and has done the mischief only of a day or two, and the remedy has been brought to bear upon it rapidly, fully, and successfully, then the changes from bad to good may be plain, palpable, and at once. The symptoms of the disease may be swept away, and the mischief done in a day or two may be undone in a day or two, and all may soon be well. But when inflammation has gone on for a week or ten days, and has done the mischief of a week or ten days, then, though it may still be within the possibility of cure, it cannot be brought to yield instantaneously to the curative impression of any remedy. The changes from bad to good will not be discernible at once. What it has taken a week or ten days to do, it will take at least a week or ten days to undo. All may be well in the end, but all cannot be well speedily.

Now in these last cases, considering the long interval that elapsed between the appearance of the ptyalism and the cessation of the murmur, and considering the fact that other remedies were employed together with mercury, I do not pretend to assign to mercury the exact share it had in procuring the result, and I can well pardon any man, who is not satisfied from my mere statement, that it had any share at all. But all who witnessed the cases were satisfied, from their own observation, that it had a material share. We were all struck by this remarkable circumstance, that the whole terror of the disease was compressed within the few days which *preceded* the salivation.

Præcordial pain, and anguish, and fluttering, and gasping for breath, and pallor, and delirium, and nervous exhaustion, and threatened syncope, all in their extreme degrees, made death the apprehension of almost every hour, for four days and nights in one case, and for five days and nights in the two others. But though the murmur still continued in one case twenty-four days, in another nine days, and in another twenty days after the salivation, yet no sooner did it take place than the terror of the disease was gone. Henceforth the cases still needed anxious watching, and still needed careful treatment. But it was treatment of a different kind, and upon different terms. It was such as, instead of continually applying and pressing remedies to counteract progressive inflammation, kept them in reserve, and brought them to bear upon this or that distressful symptom as it happened to arise. The inflammation seemed gone, but its effects remained; and both the constitution and the heart itself required some helps of medicine, that they might be enabled [illegible] sustain them until such reparation as was possible should be finally accomplished.

Such are the remedial effects of mercury, when it enters into the treatment of pericarditis, and produces salivation *rapidly*.

But mercury may enter into the treatment of pericarditis, and produce salivation *slowly*, even very *slowly*. It so happened in five of the cases which fell under my care. In one it took eight days, in two eleven, and in two, thirteen days to procure ptyalism or fætor of the breath or soreness of the gums.

Now in all these cases, bleeding and other antiphlogistic remedies and opium were meanwhile employed from day to day, and with good effect. They kept down vascular and nervous excitement, they assuaged pain, they abated palpitation; and in the end the exocardial murmur ceased, and life was saved.

These cases, perhaps, you would throw aside at once, and think it a foolish fancy to be searching into them for proof of any remedial power of mercury. Perhaps you would think that to those other means of acknowledged power and efficacy, which did manifest service from day to day, must be justly ascribed the whole credit of finally saving life and inducing reparation, and that to mercury, which produced no sensible effect until eight, or eleven, or thirteen days were past, cannot reasonably be due the smallest share in the result.

Nevertheless, I must profess my strong persuasion that mercury had a share, and an important one, in the result.

In all the five cases common antiphlogistic remedies were fairly and fully employed; and, when no salivation appeared after many days and it became more and more doubtful whether it would ever take place, they were used with the more earnest purpose of making them do all they could do, as if the whole cure depended upon them, and as if there was no other remedy in reserve, no mercury, which might yet come into operation at last, and complete the work which they had left imperfect. Now what happened? Not in a single instance of all the five was there the best and surest evidence of inflammation arrested, and reparation begun, until mercury, though late, had produced its specific effect. Not in a single instance did the exocardial murmur cease to be audible, until salivation appeared.

Recollect the common antiphlogistic remedies had already had in one case eight days, in two cases eleven days, and in two cases thirteen days allowed them, to do all that they could do alone. And it is strange, indeed, that in some one or two at least of these cases they should not have procured the cessation of the murmur, if they alone were capable of procuring it, before the salivation arrived.

This is a fact worth noticing; but it is merely a negative fact, and cannot be pressed to bear testimony to the comparative efficacy of this or that remedy. As to the exocardial murmur, though it ceased at last in all these cases, yet it continued in every one of them for a long time after salivation had taken place, in some for several days, and in some for more than a week. But, prior to its cessation, there were signs which gave us assurance of inflammation being brought to an end, and of life being saved; and these were so coupled with the occurrence of salivation, that it would have been unreasonable to doubt of mercury being mainly instrumental to the result.

I will relate, then, summarily, the plan of treatment, and the progress of recovery in these cases, marking the changes consequent upon the impression of the several remedies, and of mercury among the rest.

At the beginning, every thing seemed favourable to the cure. The treatment commenced with the administration of mercury in the way best calculated to insure its specific effect, and proceeded, without remission of its use, day by day. And from the first, also, and day by day, venæsection, or cupping, or leeches, blisters, and opium, were employed, according as indications required them. And these fulfilled their immediate purposes. Pain, and anguish, and dyspnœa, and palpitation, were relieved. Yet there was no salivation. But pain, anguish, dyspnœa, palpitation, all, or several of them, returned; and they were again relieved by some, or by several of the same remedies. Yet still there was no salivation. And again, in like manner, the same symptoms returned, and again were relieved by the same remedies. Yet even still there was no salivation.

But after several times thus going and coming, the symptoms became more and more modified by weakness, and at last fearfully so. And after several times thus giving relief, the remedies gave relief less and less, and at last not at all. Thus medicine seemed at the end of its resources, and the patient sure to die.

Now at the commencement of the disease, when mercury had been given for two or three days, and no salivation appeared, other remedies (it has been said) were pressed more earnestly and vigorously, from an apprehension that our sole dependence must rest upon them. Nevertheless, mercury continued to be given all along, and more largely as the constitution was found more reluctant to accept its influence, and more largely still as other remedies seemed losing their power. Then, in addition, to as much calomel, united with opium, as the stomach and bowels would bear, a drachm of strong mercurial ointment was rubbed in three or four times a day.

But after long delay, and in our utmost need, salivation came at last—and with the salivation there came a pause of the disease. The patient, whom we expected to die yesterday, was found alive to-day. Had the evil symptoms of yesterday been augmented in the least degree, he must have died. It seemed hardly possible; but they remained just as they were, and he was alive still. The disease had almost touched upon dissolution, and *there* it paused.

But could this mere pause, the patient being yet in such extremity, be taken for a ground of hope? Yes! even for a strong ground of hope, occurring, as it did, under such circumstances, and coincident with salivation. For in these cases, after another day or another night, or sometimes within twenty-four hours, amendment began to follow this pause; amendment, however, which was rather in the patient's own feelings than in our knowledge. Nevertheless, real amendment. We could not yet calculate the particulars in which he was better: yet he felt himself better. He had less nervous alarm, less starting from sleep, less fear of syncope from accidental movements of the ody to this side or that.

To *our observation* there was still no change of *symptoms* mmediately referable to the heart. From what we could learn y our percussing, and listening at and feeling the chest, there as the same præcordial dulness, the same exocardial murmur, e same unequal, feeble, fluttering impulse. But there must ve been some change in the actual conditions of the disease; d that change might have amounted to an arrest of the in- mmatory movement at least, and a stop of further effusion. could not tell what it was. The patient had the witness hin his own nervous system, and in his own inward consciouss, that a change had taken place, and for the better. And had witness of the same in those sure outward manifestations, by which the nervous system signified, both waking and sleeping, that it was more at ease.

Thus from the time that the ptyalism appeared, although the exocardial murmur was still audible in one case for several days, in another for more than a week, and in another for more than a fortnight, we began to feel assurance, first that the disease had come to a pause, and then that the patient was further and further from death, and nearer and nearer to a state of safety, And it was pre-eminently the nervous system which began and continued all along to give us this assurance.

But the nervous system was not only the chief witness, it had also now become (if I mistake not) the great agent of the patient's safety and recovery. And, as such, it now demanded our chief care. We had done with addressing remedies to the vascular system. Bleeding had had its effect, and mercury was now happily in the course of its operation. Our business was to soothe, and tranquillise, and comfort the nervous system. There was little more to do, but there was need of doing it effectually and well. I recollect, in a particular instance, that four hours' sleep, procured by the dexterous use of opium, marked the exact period of the patient's safety, and did the work of a week in furthering his convalescence. He woke with the number of his pulse, and the number of his respirations, greatly reduced, and thenceforth neither of them ever regained an excessive frequency; and though the exocardial murmur remained for more than a fortnight afterwards, reparation was manifestly going on.

Such was the course of treatment and the progress of recovery in certain cases of pericarditis, where mercury was slow to procure salivation, but procured it at last. I have endeavoured to make myself as intelligible as I could in noting the circumstances which seemed to assign to the different remedies the shares they had in the result. And their shares, in my judgment, may be apportioned thus:—Common antiphlogistic remedies could mitigate, could retard, could do all but effectually stop the inflammation of the pericardium, and set reparation fairly at work. Mercury took up the cure where common antiphlogistic remedies had left it, and came in with its peculiar power and efficacy to complete what they were not able to accomplish. And then inflammation ceased, and reparation began.

I confidently believe that in every one of these cases death ould have taken place at an early period, and long before livation arrived, had not common antiphlogistic remedies been portunely and vigorously employed. And I as confidently lieve that, in every one of these cases, death would have taken ace at a later period, had not the remedial power of mer- ury been still in reserve, and had not salivation arrived at last.

If we would fairly represent the power of any remedy, we ould not merely point to its more striking effect in a few ses, but should be at the pains to exhibit truly its ordinary eration in the majority of cases which occur. On this account, have dwelt the longer upon the operation of mercury in those ses of pericarditis in which it is slow to produce salivation ; r such, undoubtedly, are the majority.

These, also, are the cases which seem to me to contain e surest proof of its remedial power. Not that *then* its medial power is the greatest, but that from circumstances it n *then* be more clearly seen to be remedial; for they show oth how far the cure can be advanced by common antiphlogistic medies, and how much further it can be carried by the help f mercury.

These, moreover, are the cases in which foreign and English ractice in the management of pericarditis may be fairly brought nto comparison, and in which it may be seen where and how he one so often fails, and the other is so often successful.

In foreign practice no mercury is used from first to last, but ll the power of common antiphlogistic remedies is brought to ear upon the disease; and thus its symptoms are mitigated or ubdued: yet they return again and again, and are again and gain mitigated or subdued. And so the patients are kept alive or a week or ten days, and then they die in the great majority f cases.

In English practice mercury is given from first to last. But t is for a long time as if it were not given at all, for it produces no sensible effect. Common antiphlogistic remedies, however, are able again and again to mitigate and subdue symptoms; and so at the end of a week or ten days the patients are still alive. Yet they are ready to die; but in the great majority of cases they do not die. Salivation arrives late and seems to save them.

LECTURE XVI.

OF ENDOCARDITIS, INDEPENDENT OF RHEUMATISM.—THE CLINICAL KNOWLEDGE OF ENDOCARDITIS ALTOGETHER A NEW KNOWLEDGE.—THE WAY IN WHICH IT WAS OBTAINED SUGGESTS THE WAY IN WHICH IT MAY POSSIBLY BE ENLARGED.—CASE OF ACUTE ENDOCARDITIS INGRAFTED UPON CHRONIC VALVULAR DISEASE.—CASES OF ACUTE ENDOCARDITIS COMBINED WITH PERICARDITIS IN A PREVIOUSLY SOUND HEART.—CASE OF SUSPECTED ENDOCARDITIS UNDER A MORE CHRONIC FORM.—GENERAL REMARKS.

A FEW years ago, acute endocarditis was a disease almost unknown: yet, in fact, it must have been just as frequent a disease formerly as it is now. Where, then, lay the secret of our former ignorance and of our present knowledge? Let us try to trace it out; and in so doing, we shall see what time, what instruments, and what happy opportunities, are all needed to perfect the diagnosis of an internal disease.

Morbid anatomy failed to find it out; because morbid anatomy had not opportunities sufficient of investigating it. People rarely die of endocarditis, while the characters of an acute inflammation are yet traceable in the heart. Before they die, these are commonly obliterated, and there remain puckerings and thickenings of the membrane, which are, in truth, the marks, not of the disease, but of its imperfect reparation.

Clinical observation passed it by: because clinical observation had not yet learned the use of auscultatory signs in reference to the heart. And when their use was generally understood, it was still the work of much time, and the labour of many minds to simplify their application, and to understand how a single sign, denoting only one thing absolutely, is involved in several diseases, and helps us to discriminate them; how the endocardial murmur especially, which only implies mechanical injury done to the endocardium, helps us to determine that this injury is in one case the effect of by-gone disease, or slow disorganisation, and in another the product of present and progressive inflammation. Now it is the force of concomitant circumstances which stamps their peculiar diagnostic value upon auscultatory signs. And these circumstances clinical observation had still to study, long after it knew the signs themselves, and understood their primary import. The endocardial murmur it had known, and its primary import it had well understood for years before it reached the sure diagnosis of endocarditis, and was made aware of how important a place it occupies among diseases. It was the study of concomitant circumstances which, in this great instance, both perfected our diagnosis, and enlarged the sphere of our pathological knowledge.

Acute endocarditis may, hereafter, turn out to be of still more frequent occurrence than it is at present known to be. Future clinical experience may find it in frequent alliance with other forms of disease besides rheumatism; and so, teaching us under what circumstances to expect it, may set us on searching for it, and thus may prevent us from overlooking it when it really exists. The facts for clinical observation to fix upon as evidence of acute endocarditis are these: First, an audible endocardial murmur recently declared; secondly, the coincidence of its origin in point of time with such general vascular action as is deemed inflammatory. For my own part, I have, at present, no familiar knowledge of the conditions indicated, except in cases of acute rheumatism.

I have seen, indeed, acute endocarditis when it has not been in alliance with rheumatism, but neither so often, nor under circumstances so marked, as to gain much instruction by seeing it.

In the following case, endocarditis was concealed under a vast complication of disease. The patient was under my care and observation for a week, yet in the mean time I had not the skill to discern it. It was unfolded by dissection after her death.

December 19, 1837, Harriet Platford, aged 14, came into St. Bartholomew's to die. Her lips were livid, her lower extremities œdematous, her pulse small, frequent, feeble, and irregular. She groaned, she coughed, and she gasped for breath. Auscultation found sibilus and crepitation proceeding from every part of both lungs, but the whole chest resonant to percussion. This indicated a diffused bronchitis. It found also an endocardial murmur accompanying the systole of the heart, which was heard chiefly at the apex. This indicated disease at the mitral orifice. The heart's impulse was greatly increased.

This poor girl, young as she was, was a servant of all work in a humble family. No distinct history could be obtained from her of the origin and progress of her complaint. She had been long ill. It was only during the last three weeks that her legs had begun to swell, and cough and dyspnœa had become severely oppressive.

She was kept alive a week. Diuretics were administered. Very small quantities of blood (two ounces) were thrice drawn by cupping from below the scapulæ, and a blister was applied to the sternum; while she was upheld in the mean time by small quantities of wine. One day she gained a little relief, and lost it the next. She rallied and sank, and rallied and sank again. At length the ear caught no sound, either healthy or morbid, during respiration. All was dull to percussion. She became more and more livid, was insensible, was convulsed, and died.

Dissection found all that was expected, and *something more.* All organs were congested with blood. The liver was large and dark. The kidneys had their pelvis and tubular structure stained of a deep red. The mucous lining of the larynx, and trachea, and bronchi, were deeply livid. The lungs were gorged. The cavity of the abdomen contained two pints, and each cavity of the pleura one pint, of yellow serum. The pericardium was distended with serum; and the endocardium of both sides of the heart was of a deep red colour. The mitral orifice would scarcely admit the passage of one finger, and one process of the mitral valve and the chordæ tendineæ springing from it were ossified. Added to all this, the lining membrane of the left auricle, near its opening into the ventricle, was covered with little granules and beads of lymph, and the same were found upon the mitral valve.—W. 24, 68.*

These last appearances contain the evidence of acute inflammation of the endocardium. Yet, in the present state of our knowledge, no human sagacity could have divined its existence during the life of the patient. It probably arose not many days before death. But its own distinctive murmur was merged in the murmur already existing, and derived from the ossification of the mitral valve.

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* The state of the cavities and the muscular structure of the heart is unaccountably left unnoticed in the record of the dissection.

The case, however, was worth relating in some detail, only to show, under what pathological conditions, besides those of acute rheumatism, endocarditis may occur.

It appears, then, that acute inflammation may be ingrafted upon previously existing chronic disease of the endocardium, and that it may arise during the last days of existence, when the vascular system is especially disturbed, and blood is obstructed and retarded in its passage through the lungs and through the heart.

The next case is made up partly of what was communicated to me, and partly of what I myself observed. From what I understood of the nature of the first attack, and the condition in which I found the heart on auscultation a month afterwards, I have no doubt that the disease was acute inflammation of the endocardium, which had its origin in cold and fatigue, operating upon an enfeebled body.

"A. C., æt. 18, had the nettle-rash at Eton about three months ago. He came to London on its partial subsidence, and being very weak, was ordered a course of steel medicines, which he took for five or six weeks. But he still continued weak, and unable to ride on horseback, or take other active exercise, to which he had been accustomed. Four weeks ago he witnessed a cricket match, and stayed on the ground after sunset, and suffered a chill. I saw him on the 29th of August. Tongue furred, pulse 108, rigors, pain in the legs, stiffness down the back, and a very slight pain at the cartilages of the lower ribs on the left side. Leeches removed this pain, and he was ordered calomel and James' powder and salines. On the third day of my attendance, he was much worse. The pulse rose to 135, and the heart beat with great vehemence. He was bled by venæsection to 30 ounces, and afterwards had leeches every other day to the cardiac region. He was also cupped, and was brought under the influence of mercury, and had three or four blisters."*

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* Thus far the report of the case was furnished me by Mr. Woakes, of Luton, Bedfordshire.

The daily progress of his convalescence is not detailed in the report, which goes on to say,—"For the last six days the patient's condition has been stationary; pulse 98, heart's action heard to a great extent, but *bellows-murmur much* less than it was. He had never had rheumatism, or palpitation, or any disease of the heart before."

It will be observed that the "bellows-murmur," the sign most expressly characteristic of the supposed disease, is not noticed until a very late period. This must have been an omission from inadvertence. For when mentioned, it is so as to imply that it had existed for some time previously.

The patient was brought to town on the 27th of September, for my advice and opinion upon the state of his disease. He had a peculiar aspect of distress. His complexion was pale, with a slight flush. His breathing was hurried, and the more so upon the slightest movement. His pulse was very feeble, and very small, and frequent. He had some small purpurous spots on one leg, just above the instep. The lower half of the præcordial region was dull to percussion, and the impulse of the heart was felt far beyond the apex. Being examined in the erect posture, a loud endocardial murmur was heard in every part of the præcordial region, equally at the apex and the base of the heart. At the base the murmur became double, and it was continued, with hardly any abatement of its intensity, along the subclavians and carotids. Being examined in the supine posture, the murmur, as such, was lost to the ear, both in the heart and in the blood-vessels, but still a sound was audible in both, which was different from the natural and healthy sound. The left side of the chest was altogether resonant to percussion, except, as before remarked, in a certain portion of the præcordial region; and a healthy respiratory murmur was given out by every part of the left lung. But the right side was dull to percussion all round, below the level of the angle of the scapula and of the mamma; and it was doubtful whether, throughout this space, there was any audible respiratory murmur. He lay best on the right side.

At the time I saw the patient, and made this examination, a month had just elapsed since the first attack. What I found gave sufficient evidence of injury done to the mitral and aortic valves, and of fluid effused into the cavity of the right pleura.

From a certain jerk accompanying the systole of the ventricles, I suspected, moreover, adhesion of the pericardium.

Five months afterwards, in the following February, he was brought to town, and placed under my care. His body was extensively anasarcous, and the cavity of the abdomen and of each pleura contained some fluid. He was deeply jaundiced. His liver was felt lower than the navel, and reaching across the abdomen from the right to the left hypochondrium. His jugular veins were full and prominent, and the whole venous system was loaded with blood. The great force and extent of the heart's impulse, and the large space of præcordial dulness, sufficiently declared the left ventricle in a state of hypertrophy; and a loud endocardial murmur audible every where in the præcordial region, and beyond it in front of the chest, while it was carried along the aorta and the carotids, left no doubt of valvular injury both at the aortic and the mitral orifices.

By medical treatment the anasarca was dissipated, and the chest and the abdomen were emptied of the fluid, which they contained, and the liver was reduced in size, so that it could no longer be felt. This was the work of three weeks; and thus he was set free from the more formidable consequences of his disease. But the disease itself remained within its original seat, the heart. And in three weeks more he was dead. The heart by the simple vehemence of its action had (as it seemed) the power to kill him. Air passed uninterruptedly through every part of his lungs, yet the dyspnœa he suffered was constant, and it became an agony on the least movement. His head was racked with continual pain. He was almost without sleep. He became delirious, and then maniacal, and then convulsed, and at last sank from exhaustion of his nervous system.

The case, however, after all, must be left incomplete: permission was not granted to examine the body after death, and thus the best proof was wanting of what the disease of the heart really was; yet, even with this defect, the case deserves to be recorded. For it can hardly be doubted that the disease was acute endocarditis, and it is most probable that pericarditis was conjoined with it from the first. The period of its origin was well ascertained. It sprang from one of the common causes of inflammation, and it was unconnected with rheumatism.

Dr. West, from his large experience of the diseases of children, has contributed some cases of idiopathic endocarditis. One of them is quite to our present purpose, and I shall quote it.

"Daniel Bain, aged 11 years, living at No. 37, Thomas Street, Stamford Street, is one of 12 children of healthy parents. Nine children are still living, one died while teething, one of scarlatina, and one of pneumonia. There does not appear to be any phthisical taint in the family.

"Daniel has had good health, with the exception of mild attacks of measles, hooping-cough, and scarlet fever; and was as well as usual until May 8, 1843, when he complained of feeling cold, and began to cough. The chilliness was succeeded by fever, and he continued gradually getting worse till the 13th, when I visited him for the first time. He had had no other medicine than a purgative powder.

"*May* 13.—I found him lying in bed; face dusky, rather anxious; eyes heavy; respiration slightly accelerated; frequent short cough without expectoration; skin burning hot; pulse frequent and hard. The child makes no complaint, except of slight uneasiness about the left breast.

"There is slight tenderness on pressure over the heart, with very extended dulness. The heart's impulse is not increased. A very loud and prolonged rasping sound is heard in the place of the first sound; it is loudest a little below the nipple, though very audible over the whole left side of the chest, and also distinguishable, though less clearly, for a considerable distance to the right of the sternum. Second sound heard clearly just over the aortic valves, not distinct elsewhere, being obscured by the loudness of the bruit.

"Respiration good in both lungs.

"I ordered the child to be cupped to ℥vj. between the left scapula and the spine; and gave gr. j. of calomel, with the same quantity of Dover's powder, every four hours.

"*May* 14.—Sense of discomfort at the chest relieved by the cupping. He slept well during the night, and to-day looks less anxious, though his eyes are still heavy and suffused; the skin is less hot and less dusky; pulse 114, thrilling, but not full; tongue moister than yesterday, red in the centre, coated with yellow fur at the edges; has had one copious watery evacuation; slight prominence of the cardiac region. The heart's sounds are obscurer and more distant than yesterday; the bruit of yesterday is now manifestly a friction sound, which is louder at the base than at the apex of the heart; the first sound is altogether obscured by it, and the second is heard only over the aortic valves.

"The child has had four powders. To continue taking them every six hours, ʒj. of strong mercurial ointment to be rubbed into the thighs every six hours. Six leeches to be applied over the heart.

"*May* 15.—There was considerable difficulty in stopping the bleeding from the leech-bites, which was so profuse as to make him rather faint. He slept tolerably during the night, and until 6 A.M., when he became light-headed, and continued so until 9 o'clock this morning, but has since lain quiet, though troubled by a dry cough.

"His appearance is much as yesterday; skin dry and hot; pulse 120, possessing the same character as before, but with less power; tongue coated at the edges, with a dry red streak in the centre; bowels open twice, motions green and watery.

"Auscultation yields the same results as yesterday. Same treatment continued, with the addition of a saline draught containing small doses of the liquor antimonialis every four hours.

"*May* 16.—General condition much as yesterday, but on the whole seems slightly improved; pulse 120, softer.

"The friction sound is no longer audible, but a loud rasping sound is heard in the place of the first sound. The second sound can now be distinguished at the apex of the heart as well as over the aortic valves, and is quite natural.

"On the 17th, the gums were slightly affected by mercury and the bruit was thought to be softer and rather less loud. The dose of calomel was now reduced to gr. ss. every four hours, and the child was allowed a little broth.

"On the 22nd his mouth was very sore, and all active treatment was discontinued on that day. The child gradually regained his strength, but the bruit accompanying the first sound continued, and was heard a month afterwards with no other change than being rather softer and more prolonged."*

In how many prominent circumstances does this instance of idiopathic endocarditis run parallel to the course of endocarditis in numerous instances connected with acute rheumatism! Its accession is quickly followed by the accession of pericarditis, then both proceed together for a few days; then the exocardial murmur which belongs to the latter ceases, marking the permanent adhesion of the pericardium. But the endocardial murmur which belongs to the former remains and continues alone, and still abides, after the boy has recovered his health and strength, marking a permanent injury of the valves.

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* Med. Gaz. vol. xxxii. p. 738. An important paper.

While, therefore, at present our chief knowledge of endocarditis is as an accompaniment of rheumatism, yet, whenever we catch a glimpse of it under other conditions, we recognise it as in itself pathologically the same, affecting the same course, admitting the same complications, needing the same remedies, and leading to the same events.

The following could surely be no other than a case of endocarditis. What neither its history nor its symptoms could clearly show, was sufficiently denoted by the nature of the treatment which effected its cure.

H. B., æt. 43, presented himself to me one morning, with a countenance full and florid, and complained of a pain and sense of weight and tightness between mamma and mamma, occupying a space large enough to require the whole hand to cover it. The pain, he said, was not constant, but was more *on* than off. It had thus endured between two and three months, and was certainly upon the increase. Lately some dyspnœa had been added to it. The dyspnœa, but not the pain, was augmented by exertion. His pulse was 80, and regular, without any peculiar character of hardness or fulness.

Auscultation found a perfectly healthy respiration; but a very loud systolic endocardial murmur at the apex of the heart. On this occasion, he, being very hot and perspiring, was examined through his shirt and flannel waistcoat. The man was a collector of taxes. He had never known illness before. He was habitually a full liver, eating abundance of animal food, and drinking plenty of beer and porter.

In this case I had no other thought than that the murmur proceeded from some tardy conversion of a portion of the mitral valve into cartilage or bone, which by its gradual increase had now reached a point at which the heart and the circulation must begin to feel it, and must ever continue to feel it, painfully and injuriously. I could not, however, tell how long the murmur had existed, and so, for the sake of creating a little hope for myself in the management of the case, I was willing to believe that it might not have existed earlier than the date the patient gave of his own uneasiness, and that it might then have arisen from, and might still be due to, some active process of disease within the reach of a remedy; and I set about its treatment accordingly.

I ordered ten leeches to the præcordial region, and some active aperient medicine; and I enjoined a rigid abstinence from all wines and fermented drinks, and perfect rest at home. Three days afterwards, he spoke of a general sense of relief; but said the pain was more abated than the dyspnœa. I now made a more accurate auscultation of the bare chest, and found the murmur less loud. It accompanied the systole, and the limit within which it was heard included about an inch and a half of the præcordial region, viz. the mamma, and a little space on the sternal side of it and below it. There was dulness to percussion at the apex, and for a couple of inches lower down. There was no perceptible increase of impulse. The murmur, which was manifestly less while he remained still, became as loud as ever after he had walked twice across the room.

I ordered ten more leeches to the præcordial region, and two grains of calomel every six hours.

In three days more the murmur had certainly still decreased; there was no salivation; he was ordered to continue the calomel.

In seven days more, he was fairly salivated, and had been so five days; I was not certain of any murmur; the sounds of the heart were loudly intonated, but it was doubtful whether they were really unnatural. I wished the salivation to be still maintained by two grains of calomel taken every night.

In seven days more, upon a very patient auscultation I satisfied myself that there was still just that degree of prolongation, and that slight roughness of the first sound which one hears before the murmur is decidedly audible in acute rheumatism. Exertion brought out the real murmur, but it was very faint; no dulness to percussion remained in the [illegible] indicated.

[illegible] ed.

[illegible] d that since I last saw him he had been following the same plan of treatment, except that he had not observed perfect rest; he had walked about as usual in his business, but had been careful to avoid all hurry; he spoke of a *sensation about his heart;* it was not pain; he could not tell what it was, or whether it was without or within; it was something which did not naturally belong to him; it was not always present, nor was it increased by exertion; but there was something which he could only call *a sensation.* After very attentively examining him, and making him walk rapidly about my room, my ear could detect no murmur, or any other unnatural sound accompanying the movements of the heart.

If I have rightly interpreted the nature of this case, here was endocarditis arising and existing as the whole and sole disease, unaccompanied by rheumatism or by any other known malady elsewhere in the body. At all events, here was a formidable group of symptoms, all referable to the heart, and all gradually disappearing, and the murmur among the rest under the use of remedies addressed to the purpose of arresting inflammation.

This case teaches a practical lesson of some value. It is this —that we should be slow in reckoning diseases to be incurable. The murmur was not known to have its origin in inflammation of the endocardium, but was found among other symptoms referable to the heart, which had existed between two and three months. Yet both it and they were successfully treated, and ceased. This instance, therefore, gives us encouragement to hope sometimes beyond what we know, and to direct our treatment accordingly. Where palpitation, dyspnœa, and præcordial pain, of no very remote duration, are found in alliance with the endocardial murmur, we should make the most of it, as an indication of treatment, in the hope that the whole disease may depend upon a covert and slowly progressive, but remediable endocarditis.

There is no part of pathology which calls for the more earnest regard of medical men than the diseases of the endocardium, especially with a view of making out what they are in their first formation, and noting, with clear marks of distinction, those which are simply inflammatory, and come within the possibility and promise of cure.

Of how many cases of complex disorganisation of the heart, already gone far beyond the possibility of reparation, does valvular disease form a part! In the vast majority of these, there is reason to believe that the valvular disease was the original and elementary change of structure to which all the rest was superadded as a natural and necessary consequence, and that there was a time when it existed singly and alone, without either the dilatation of the cavities, or the hypertrophy of the muscular substance, or whatever else may make up the complex disease which is at length found.

Well, then, it is this valvular disease that we want to know more about. In many instances it can be traced back to an attack of acute rheumatism, when the endocardium was inflamed. But in many more acute rheumatism forms no part of the history. What, in such instances, is the nature of this valvular disease, or rather what *was* it from the first? It is too discouraging a view of the matter to regard all valvular disease, which is not traceable to an attack of acute rheumatism, as essentially chronic and irremediable from the beginning, and so give up further inquiry in despair.

Remember, it is not long since this district of pathology to which I am pointing, was utterly dark. It is but lately that clinical research has thrown light enough upon it to show that there is such a thing as inflammation of the endocardium; acute, rapid, lymph-depositing inflammation; inflammation in its nature curable; and, when perfectly cured, allowing the membrane to recover its integrity as if it had been never diseased; and when imperfectly cured, spoiling a valve, and leaving it to become a point of departure, from which the heart may proceed to any mode or extent of disorganisation which it is capable of. But (I repeat) it is in alliance with rheumatism that all, or nearly all, which we thus know of endocarditis has been learnt and authenticated. A glimpse, indeed, has been caught of it apart from rheumatism, enough to show that it may exist, but not enough to familiarise us with it under other conditions; not enough to bring those conditions distinctly into view, to enable us to say what they are, and to know from them when to expect it, and be prepared to treat it.

It would be well for those who feel strongly the desirableness of more knowledge upon this subject, to consider how it is most likely to be obtained. Now I see little to hope from any

This book is the pro
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more curious scrutiny of auscultatory signs, or from any further poring and pondering over symptoms immediately referable to the heart itself (the heart itself already speaks plainly enough about its diseases, if that were all); but I look with better promise to clinical research among fevers and febrile ailments of the constitution at large. For it was by the light first let in from thence, that the discovery was made within our own time of some of the most important diseases to which particular organs are liable. These diseases had for ages remained occult; and they were so because, during the period of their greatest activity, they are wont to put forth no symptoms calculated to arrest attention. But now that the diseases themselves are known, their symptoms are found to be sufficiently definite. They are, however, such as require to be sought after before they are found. But whence do we get our hint to search after them? Even from the more general and more apparent conditions of disease with which experience has found them naturally associated. Thus having typhus fever to deal with, we seek for follicular ulceration of the intestines, and often find it. Having scarlet fever, we seek for inflammation of the kidneys, and often find it. Having acute rheumatism, we seek for endocarditis, and often find it. It was, indeed, a great thing—a thing to be valued at the worth of many lives—to find out these natural alliances of ulceration of the intestines, inflammation of the kidneys, and endocarditis, with those several more prominent and obvious conditions of disease in the constitution at large.

But, doubtless, each of these several diseases of particular organs occurs unallied with any such fevers of well-known type and character. How often, I cannot tell; probably much oftener than any one suspects. As to endocarditis, we have lit upon it a few times by accident, obscured by circumstances, but at an early and curable stage, when it would probably have been cured, had it been more clearly seen, and had it presented a steadier mark for the aim and direction of medical treatment. And, times without number, we have met with chronic valvular disorganisations which might have, and probably had, their origin in some attack of endocarditis, which was never known, and never treated.

But sometimes to light upon it by accident, and oftentimes o be hopelessly admonished by its fatal consequences that it as existed, would seem to imply that clinical observation has et much to search after, and (it is hoped) has yet much to ind, respecting the origin and progress, and various pathological elations of endocarditis.

Of what endless and still increasing necessity is this business f clinical observation to the improvement of our art!! All hat has been found out by those who have gone before us does ot leave less, but more to be sought after by ourselves. Each ew fact is a mere curiosity, while its value and its uses are et undetermined. Labour or chance may have first disclosed t, but its value and its uses can only be ascertained by long bservation and experience. For, until it be seen, how other acts, already known, naturally group themselves around it, we an understand neither its place nor its bearing in the system f things to which it belongs. In this way does each newly iscovered fact suggest and multiply new inquiry; and thus here are never wanting to our profession fit objects for the best understandings to pursue.

Clinical observation, with a view of keeping a man up to what is known, and perfecting him in its accustomed uses, may be an affair of sober industry only, of patient and almost passive looking on. But clinical observation, with a view of knowing more than is known, and turning new knowledge to its uses, belongs to an industry of another kind, to an energy ever active and stirring, and drawing upon, and working with, the highest faculties of the mind.

LECTURE XVII.

PERICARDITIS INDEPENDENT OF RHEUMATISM.—SHOWN BY MORBID ANATOMY TO BE OF COMMON OCCURRENCE.—ITS SMALLER DEGREES THE MOST FREQUENT.—PROBABLY HARMLESS.—GENERALLY BEYOND THE REACH OF CLINICAL DIAGNOSIS.—ITS GREATER DEGREES NOT BEYOND ITS REACH, BUT APT TO ELUDE IT.—WHY.—*COVERT* ACUTE PERICARDITIS AND *COVERT* ACUTE PLEURISY COMPARED.—REVIEW OF CASES WITH THE PURPOSE OF FINDING WHAT NATURAL ALLIANCE PERICARDITIS MAY HAVE WITH OTHER GENERAL PATHOLOGICAL CONDITIONS BESIDES RHEUMATISM.

THERE is no structure of the body more liable to inflammation than the pericardium. Of those who have reached adult age and upwards, one half (it appears) have suffered pericarditis at some period of their existence. But then, in the vast majority of cases, it is neither detected, nor perhaps detectible, during life. It comes and goes unnoticed, and neither by itself while it remains, nor by its effects when it has ceased, does it do any amount of injury capable of interfering with the healthy actions of the heart. Hence in five cases out of six there is no clinical history to be given of pericarditis. How and when, and under what circumstances it takes place in the living man, we have not the smallest experience. All our knowledge of it is from its effects which we discover in the corpse.

All those white spots upon the surface of the heart, which have engaged and perplexed the speculation of pathologists ever since they have betaken themselves to dissection, have at length been demonstrably shown by Mr. Paget to be the effects of inflammation. To show the absolute frequency of pericarditis, and the comparative frequency of the slighter and severer cases, Mr. Paget gives the following summary of his dissections:—"Including these white spots among the effects of pericarditis, I find that, of 110 cases which I have lately xamined at St. Bartholomew's Hospital, 58 have presented igns of having suffered at some time from that disease. Among hese, 40 out of 66 males, and 18 out of 44 females were thus ffected; and, with respect to their ages, the morbid appearnces were found in 5 out of 14 below twenty; in 25 out of 53 etween the ages of twenty and forty; and in 28 out of 43 bove forty. Of these 58 cases of pericarditis, 49 were slight ases marked by white spots and adhesions, or by effusions of mall quantities of lymph; and nine were severe, with complete dhesion, or with abundant recent effusion."*

But in the slighter cases of pericarditis, though neither ain nor any disturbed action has ever led to a surmise of its xistence, yet is it not probable that the inflammation, while it vas in the act of depositing the lymph which formed the white pots and the small adhesions, gave occasion to the genuine to nd fro sound? Indeed, it is most probable. But what, hough the sound were there, if it was not heard? And heard t could not be, if it was never listened for. And, unless ttention were expressly drawn to the heart by its disturbed ction, or the patient's reference of pain to it, no one would hink of listening for it.

Surely, then, the reasons are plain enough why the lesser nd most frequent cases of pericarditis have hitherto altogether luded observation during life. And, until they are brought vithin the reach of our clinical knowledge, they cannot become he objects of our medical treatment.

Doubtless it would be to our credit, that pericarditis in all ts slighter degrees should come within our knowledge and treatment. But, because this is not the case, mankind has uffered nothing. For such pericarditis is harmless from eginning to end. It puts life to no present peril, and does no ltimate injury by its effects. These white spots and slender dhesions of the pericardium are often found where there is not vestige of *disease* besides; and then the heart at the same time is so constantly found perfect in size, and form, and capacity, that they may be considered as things almost purely innocent.

What I am now saying of the pericardium and its covert inflammation ending in white spots and small adhesions, will call to mind what, in a former lecture, I said of the endocardium and its covert inflammation, which ended in puckering, thickening, and shortening of the valves.

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* Med. Chir. Trans. vol. xxiii. p. 29.

But the inflammation of the two structures, while they are both alike in the secrecy with which they carry on their elementary process, are most unlike ever afterwards. While small patches of lymph and small adhesions of the pericardium are never felt injuriously—indeed, are not felt at all—a spoiled valve (and how little does it take to spoil it!) at once begins to baffle the functions, and ends by disorganising the entire structure of the heart. To the clinical study of the two diseases we are urged by very unequal motives, inasmuch as with respect to the one mankind suffers not at all, but with respect to the other it suffers to a great amount, from the darkness in which both are often involved in their beginning and progress during life.

I do not see how it is possible, but that pericarditis and endocarditis in their slighter degrees must ever continue to escape our notice, until they are found to have some constant or very frequent alliance with other forms of disease beyond the heart, which are better known and more familiar to our experience than they are themselves.

It is probable that the attack of inflammation, leaving such permanent effects upon the pericardium as have been described, often takes place during some fevers. Doubtless during the progress of fevers, inflammation of small degree and small extent is apt to arise and to continue for a while, and then to cease without any special remedy, or any treatment more than is included in the general management of the fever. I recollect in a case of typhus fever, about the middle of its course, a loud friction-sound being heard in the præcordial region. It continued distinctly audible for three days, and then ceased altogether.—(M. xxxi. 85.)

But the very numerous cases in question which have but lately been shown to be of the nature of inflammation, or even to partake of the character of disease at all, these slighter cases of pericarditis, stand quite alone, and offer very little promise of being better understood clinically than they are at present. We will leave them, therefore, and turn to others of greater interest.

Pericarditis, it is well known, may occur in its acutest form, and yet be unconnected with acute rheumatism. Our clinical acquaintance with it as such is indeed less perfect; and on that very account, perhaps, it is the more dangerous. For our clinical acquaintance with it will appear to be less perfect chiefly in this respect, that we have no exact knowledge of the circumstances conducing to it. And this is quite enough to make us less alert in detecting it, and less ready with our remedies in treating it.

Associated with this disease, there are certain recollections of things which made a great impression upon my mind when I first betook myself to the study of physic, and which I now feel it interesting and profitable to recal.

It was then a sort of transition period in medicine. Men were pushing their research in a new direction, but had not yet arrived at many sure results. They were inquisitive especially into what might remain of the vestiges of disease after death, as offering a promise of larger and more accurate knowledge.

In this new zeal for dissection, a vast deal of rough morbid anatomy was practised, teaching many new facts which led to some truth and to much error, the natural fruit of over-hasty conclusions.

Now, it was a long time before I could appreciate in the least degree the more important uses of the facts which dissection was daily disclosing to me. But there was one thing which I was not slow in finding out from morbid anatomy, viz. the great imperfection of the diagnostic part of medicine. That many forms of chronic disease should be often found after death, which had not been suspected to exist during life, was no surprise to me. This is what might have been expected. But I was indeed astonished that it could ever happen (as happen it frequently did), that patients who had been carefully watched day by day, should, when they came to die, be found to have perished of acute destructive inflammation of some vital organ, which had never been suspected to exist while they were alive.

It was the chest which was most frequently the seat of this acute, covert, and mortal disease; and of the parts within the chest, most frequently the pleura or the pericardium. To my amazement, the pleura or the pericardium were occasionally found covered with recent lymph, and their cavity full of turbid purulent fluid, where during life there had been neither thought nor mention nor treatment of pleurisy or pericarditis.

The students were the chief morbid anatomists in those days, who yet knew nothing of the difficulties of their profession, and made no allowance for them. To such young, sharp-sighted, inexperienced lookers-on, these unhappy instances would minister occasion for ridicule of their betters. They would pass harsh judgment on the physician, and express opinions not very complimentary to his sagacity.

But was the fault in the physician, or in the imperfection of his art? I trust it was in the imperfection of his art; if it were not so, I ought to have some painful reflections. For I confess (and it is my duty to confess) that the experience of after years, and the best care and watchfulness I could bestow upon individual cases, did not exempt me, in my turn, from the occasional mortification of finding upon dissection that a patient had died of an acute pleurisy, or an acute pericarditis, which I had never suspected during life; of pleurisy, however, much oftener than pericarditis. For, as an acute, disorganising, destructive inflammation, pleurisy is by far the more frequent of the two.

Such painful oversights are now not apt to occur; not that physicians in general, or the same individual physicians, were less sagacious formerly than they are now. There is no room for disparaging our predecessors and glorifying ourselves, or for complimenting our present selves at the expense of our former selves, in this matter. The truth is, a discovery has been made in the art of clinical observation, and we all have the benefit of it. Without the aid of auscultation, it is impossible but that the same diseases should still often go undetected. A few cases of pleurisy present themselves to me in the course of every twelvemonth, which, but for the use of my ear, I should detect either not at all, or not time enough to interfere effectually for their relief.

But before auscultation was practised, pericarditis (I mean acute, disorganising, destructive pericarditis) did not go so often unnoticed and untreated as acute pleurisy. Yet there was the same want of exact pathognomonic signs to designate the one as the other. But then, with respect to pericarditis, this most important fact had already been learnt by experience, that though its own direct signs were vague and uncertain, it was apt to be associated with other conditions of disease as plain and obvious and distinctive as possible, those, namely, which constitute acute rheumatism. Thus, wherever there was acute rheumatism, we knew that pericarditis might be; and we were sedulously on the watch for it, and ready to take the least præcordial flutter or pain as an evidence of it, and a warrant for treating it. We made sure of it from a mere glimpse, and pointed our remedies at it as if it was clearly in our view.

But when it occurred alone, or among other conditions of disease, with which it was not known to have any frequent or natural alliance, it ran a great chance of escaping detection and treatment; and it often *did* escape both, and prove rapidly fatal

And even now, with all the sure signs which auscultation has unlocked and brought from their hiding-place, it still is apt to escape detection and treatment, and consequently to prove fatal. Nearly the whole sum of my experience of acute pericarditis, independent of rheumatism, is derived from cases in which it has been concealed during life, some occurring prior and some subsequently to the use of auscultation. In the former it could not possibly have been detected for want of auscultation; and in the latter it lay concealed, because auscultation went for nothing when the auscultatory signs were not listened for.

I will now produce some specimens of pericarditis, as I have seen it occur independent of acute rheumatism. The sort of patients in whom it is found, and its attendant circumstances, may, perhaps, give some hint of the pathological conditions conducing to it.

W. B., ætat. 26, a pale, bloodless, emaciated being, was carried into St. Bartholomew's Hospital, retching and vomiting, and coughing incessantly; he had a pale, dry, rough tongue, without the least secretion upon it; his pulse was hardly perceptible, and all things bespoke him to be at the point of death. He had been brought to his present condition by an illness of five weeks. Five weeks ago he had been attacked with purging of blood, and with vomiting or spitting of blood (he could not tell which), at the same time; and these hæmorrhages continued, in some degree, for an entire fortnight.

He was by trade a journeyman tailor, a class of society which has furnished me with more cases of profuse hæmorrhage from the stomach and bowels than any other, and in which the habit of spirit-drinking is carried to the most horrible extent.

After his admission the retching and vomiting continued, but there was no hæmorrhage, and the evacuations from his bowels were natural; he became delirious; and in a day or two, delirium and stupor became his most prominent symptoms; and what little pulse could be perceived, was irregular. It was necessary to give him wine; and sometimes, under its influence, the pulse would gain a little power, and recover its regularity, but it would soon lose its power, and then it would become irregular again. A week passed, and he continued to live on, when erysipelas appeared upon his face and neck, and in three days more he died.

In this case there was no symptom which could possibly suggest a suspicion of disease of the heart, except the irregular pulse. Yet it suggested (I confess) no such suspicion to me; I saw in it only the last struggling effort of the heart to keep up life a little longer. When the pulse became *stronger* under the stimulus of wine, it for the time became *regular* also; and when, as the stimulus ceased, it again lost its power, it again became irregular. All this looked very like failure from simple weakness.

But, upon dissection, the pericardium was found to contain several ounces of serum, deeply tinged with red, and covered both on its loose and reflected portions with a very large accumulation of lymph. The lymph connected the two opposite surfaces by filamentous bands of soft texture, and was easily detached. Besides these unlooked-for appearances of the pericardium, the mucous membrane of the stomach was stippled with points of red, and was softer than natural. Throughout the whole intestinal canal, there was a redness, which seemed to be something different from simple injection of the blood-vessels, and to reside in the submucous cellular tissue. The peritoneum was pale, and contained within its cavity a considerable quantity of clear serum. The brain and its membranes were exsanguine, while there was much serum beneath the arachnoid. The lungs were sound.—(M. iii. 74.)

Here we had disclosed by dissection the sure effects of acute disorganising inflammation of the pericardium; and this it was that killed the patient. Yet were there no general symptoms notifying such inflammation any where, and no pain or other sign immediately referable to the heart, notifying that it could be there, except the almost imperceptible and irregular pulse; and this seemed to speak of *death* rather than of disease.

But this case fell under my observation before any thing was yet known of the auscultatory signs which mark disease of the pericardium. Yet had they then been as well understood as they are now, I was so entirely without any suspicion of the heart, that I doubt whether I should have applied my ear to it.

Now I have dwelt more particularly on this case, because it is one of a class (such, at least, is my impression) to which a peculiar pathological interest belongs. And it is a good specimen of that class.

It would hardly be suspected that the very act and process of dissolution could give occasion to *new* disease. But such is the fact. And it happens especially, if the dissolution be slow and lingering; and then this new disease is often even of an acute kind. In no part of the body is this new disease more apt thus to light up, at the very going out of life, than in serous membranes. Among phthisical patients, who have been dying by little and little for many weeks, the instances have been numerous, in which upon dissection I have found the marks of very recent peritonitis, the cavity of the abdomen containing a whey-like fluid, and the surface of the intestines covered with flocculent lymph, and streaked with red, and adherent where their folds lie in contact. Yet in many such cases the peritonitis has given no notice of its existence during life by its proper symptoms, and after death has occasioned great surprise by its discovery. And thus, too, pericarditis will arise when the system is at its lowest state of depression. I have known some instances (and others have been reported to me), where, after severe accidents and severe surgical operations, the powers of life being brought very low, and existence with difficulty maintained during some days, upon death eventually taking place, the pericardium has been found covered with flocculent lymph, and its cavity distended with serum mixed with pus and blood. These were the products of the most acute inflammation. But the patients were scrupulously watched during life, yet no symptoms indicative of inflammation were discovered.

A young man of unfavourable constitution suffered from inflammation of the internal structure of both eyes. He was largely bled, and brought rapidly under the influence of mercury. Great dyspnœa arose with the salivation. Both of his lungs and his larynx became inflamed. He passed into a state of coma, and after lingering for a few days he died. Upon dissection, besides effusion between the membranes and into the ventricles of the brain, and ulceration of the larynx, and hepatisation of the lungs, and a pint of fluid in the left pleura, there was found upon the surface of the pericardium covering the heart a large deposition of soft recent lymph, particularly about the origin of the great blood-vessels, and the muscular substance of the heart itself pervaded by a white interstitial deposit (apparently lymph) which was thickest near the pericardial surface.—(M. xx. 56.)

A few instances have occurred within my knowledge of individuals having been picked up in the street, and brought into the hospital in a dying state, who, nevertheless, have survived for a few days, and afforded time to investigate the conditions of their disease. Nothing, however, was made out concerning them, but that they were dying; and not the least conjecture could be formed where their disease was, or what it was. Upon dissection, the pericardium was found covered with lymph, and its cavity distended by turbid serum.

I think it worth while to add the following cases, as further specimens of the conditions under which pericarditis is apt to arise, and of its complications. They are cases which contain many points of great interest.

W. C. was a poor boy, ten years of age, who came into the hospital to die after an illness which he had already endured eight months. His whole body was œdematous, and his abdomen full of fluid. He was very pale; he was too weak to stand; and his pulse was rapid, small, and feeble.

The account given of him was this:—eight months previously he was seized with vomiting of green matter, and three days afterwards with purging of blood. This latter continued for several days, and, upon the whole, the quantity of blood lost was very large. The hæmorrhage having ceased never returned; but a few days afterwards, œdema commenced in the lower extremities, and in the course of a fortnight pervaded the whole body; fluid was then accumulated in the cavity of the abdomen. All medicines failing to give relief, at the expiration of two months he was tapped. Hereupon his kidneys began to act profusely, and in six weeks he was entirely free from all dropsical swelling, and he continued free until within five weeks of his admission into the hospital; then the dropsical symptoms no sooner returned, than they increased rapidly, and, in the course of a fortnight, they reached their extreme amount.

The poor boy seemed dying when he was brought in, yet he lived a fortnight. His days and nights were passed in extreme jactitation and perplexity, in delirium, and vomiting, and struggling for breath. His urine was loaded with albumen, and auscultation detected fluid in the chest. Three days before his death, a loud creaking crumpling sound was heard to accompany the contractions of the heart. It was audible over a large part of the chest in front. (The heart had been carefully examined before, and its sounds were noted to be "not unnatural.") The crumpling sound was accompanied by some increase of impulse; but in twenty-four hours it ceased to be audible.

Dissection found the internal collections of fluid, and the granulated kidneys, and the pale softened textures, which were anticipated; and it found withal on the surfaces of the pericardium covering, and opposite to both the auricles, a network of lymph, in which numerous soft granules were deposited. The pericardium was unusually vascular throughout, but especially at the parts from which the lymph was detached. The muscular substance of the heart, and its internal lining, and that of the aorta, were unusually red.—(M. xvii. 29.)

Here to accumulated suffering and disease, which probably first sprang from inflammation of the kidneys, pericarditis was at length added, and rapidly brought on death.

In like manner, pericarditis came and closed the scene in the next case. One opportunity only was afforded for examination during life, but it was enough to give suspicion that disease was at work upon the heart, wherever else it might be.

W. G., ætat. 50, was admitted by mistake into the surgeon's ward, whence he was presently transferred to me. He was nearly comatose, and naturally almost deaf. He lay on his back with his muscles quivering, and muttering occasionally to himself. His left eye was inflamed superficially, his jugular veins distended, but without pulsation. His pulse was 72 with power, and he flinched from pressure on the epigastric region. We succeeded in rousing him a little, but could not succeed in getting any rational expression from him, except to the effect that he felt no pain.

We could only auscultate his chest as he lay; that is, in front; and found a rhonchus mixed with large crepitation proceeding generally from the lungs, and a very peculiar bruit from the heart, which accompanied the systole of the ventricles.

Hereupon he was cupped upon the præcordial region.

In twenty-four hours he was dead.

Here, too, upon dissection, the kidneys, large, hard, pale, and mottled, and entirely disorganised by granular disease, presented themselves as the source of morbid actions, which had been going on throughout the whole body for years. On the left side, the lungs floated in three pints of bloody serum, and on the right, in two, themselves being gorged with blood. In the cavity of the peritoneum, two pints of yellow serum were effused without apparent disease of any abdominal viscus. The pericardium contained three ounces of serum; and the membrane itself, both its loose and reflected portion, was covered with a fine, reticulated, adventitious membrane of coagulable lymph, most abundant over the left cavities. It was easily detached, and left the surface beneath studded with red spots. The heart was rather large, but well proportioned in all its parts.—(M. xiii. 39.)

Such are the specimens I have to give of pericarditis, not in alliance with rheumatism. In them all, you will observe it complicated with disease of other internal parts, and especially with disease, or the results of disease, of similar structures; with inflammation, or serous and sanguineous effusion, of the pleura or peritoneum. In short, of pericarditis not in alliance with acute rheumatism, I do not know that a single uncomplicated case ever fell under my observation. I have, therefore, been the more curious to look into the experience of others, and see what they have found.

Of pericarditis, not in alliance with rheumatism, Corvisart gives five cases; and it was complicated with inflammation of other parts in all of them except one; and in this one it was caused by a severe blow upon the region of the heart. Two of his cases ran closely parallel with those which I have related, as in other respects so especially in this, that the pericarditis arose at last, and brought a long previous illness to a fatal termination.

A young Creole lady came from Martinique to Paris. When she was confined, and for six months afterwards, she managed herself ill in the affair of nursing. Corvisart was called to visit her when she was actually dying, and could only learn that, for six days, she had been suffering obscure and indefinite symptoms, and had pointed to the heart as the seat of her pain. Her pulse was irregular, and her jactitation extreme.

On dissection, pleuro-pneumonia, especially of the right side, was found; and pericarditis, which had filled the cavity with sero-purulent fluid, and spread a thick coat of lymph over the entire surface of the membrane. Here was no diagnosis of pericarditis during life.*—(Obs. ii.)

An old Creole naval officer, the victim of gout and venereal indulgences, came from Martinique to Paris. Here, after being fatigued, he was attacked with low fever. In the course of the fever he became delirious, and suffered an incomplete paralysis of the left arm. Then his breathing was impeded, then his pulse was irregular, and he died.

On dissection, serum was found abundantly effused between the membranes of the brain and into the right lateral ventricle, the inferior lobe of the right lung hepatised, and the right pleura covered with lymph and a sero-purulent fluid in its cavity, and the pericardium containing the same kind of fluid, with a plaster-like substance upon its surface. Here, too, there was no diagnosis of pericarditis during life.—(Obs. iii.)

Another case was unlike these, and unlike any which I have given. A strong middle-aged man was seized, in the midst of health and without any obvious cause, with dyspnœa, and an acute pain in the lower and left region of the chest, and on the same night with a tremendous shivering fit. On the day but one afterwards he was admitted into the hospital, already subdued by his disease, with his pulse small and fluttering and irregular, his features collapsed, convulsive movements of the face, hurried respiration, and pain in the præcordial region. It did not appear that any treatment had hitherto been employed, and what was now practised was useless. In two days more he died.

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* Corvisart, Essai sur les Mal. du Cœur.

Here were found, upon dissection, the effects of pleuro-pneumonia of the left lung, which involved the diaphragm, and of extensive pericarditis. But there was evidently no distinct anticipation of pericarditis from the symptoms.—(Obs. i.)

In another case the disease, whatever it was, was successfully treated; but that it was pericarditis, one may be allowed to doubt. Pleurisy was a part of it, if not the whole. The affection came on, after great exertion, suddenly, with a violent rigor, and with extremely severe pain—first in the region of the heart, and soon extending itself over the entire left side of the chest with dyspnœa, delirium, and insupportable anxiety. The patient was a female, and the catamenia occurring on the third day of the disease seemed to carry away its most alarming symptoms, although no remedy whatever had hitherto been employed; the catamenia stopped, and the symptoms returned with their first intensity. On the 10th day from her original seizure, she was admitted into the hospital, with symptoms which would, *now*, be considered to denote the left cavity of the pleura full of fluid, and its inflammation relieved, but not entirely cured, by the effusion. After remaining twenty-three days under judicious antiphlogistic treatment, she was discharged convalescent.—(Obs. v.)

The single uncomplicated case remains to be noticed, where pericarditis was caused by a severe blow upon the region of the heart. It might have been a fortunate specimen for studying disease in its simplest character, had it but been seen earlier. For not only was it an inflammation of the pericardium exclusively, but its cause was of the simplest kind, viz. mechanical. Its proper symptoms, however, as a disease, were past before the patient reached the hospital, and what remained were its irremediable and inevitably fatal effects. But still there is very great interest belonging to this case, and that interest is contained in the uncomplicated character of the disease, and its simple mechanical cause.

The patient, it seems, was dying when he was admitted. His pulse was "small, frequent, unequal, intermittent, and irregular;" his eyes were "sunk," his features "much changed." One remedy was ventured upon—a bleeding; but it was not repeated, and nothing else was tried. Henceforth, to his death, the record of his state is very succinct, and is comprised in "countenance more and more hippocratic; breathing continually interrupted, and very difficult; pulse vacillating, and scarcely perceptible; prostration of strength extreme notwithstanding the use of cordials; a spontaneous and almost sudden dissolution of the right eye, from a suppuration which took place in it without being preceded or attended by any inflammatory symptoms; at length, features entirely changed; pulse imperceptible; debility extreme, even to fainting; death." But though dying when he was admitted, and though every recorded symptom thenceforth gave notice and threatening of death, he did not actually die until after the lapse of nineteen days; and after death the enormous quantity of nearly four pints of sero-purulent fluid was found distending the bag of the pericardium, and its whole surface covered with a thick crust of reticulated albumen. Except that the left lung was pushed upwards, while it still was spongy and crepitous, there does not seem to have been the least change, either morbid or mechanical, found in any other internal organ of the body.

What a vast amount of disease was here accumulated upon the heart! How is it possible that the heart could bear it so long, or bear it at all? Why, consider all was sound and perfect throughout the body, from first to last, except the heart. Its disease reached it from no previous malady of the constitution. It was received from no other organ *by* it, and it was imparted to no other organ *from* it. It began, proceeded, and ended in the heart.—(Obs. iv.)

Such are Corvisart's cases, and such the sum of what it has appeared to me useful to remark upon them.

Andral gives six cases of pericarditis not in alliance with rheumatism, of which three were complicated and three were not.

His three complicated cases have a remarkable coincidence with some of those cases which I have given from my own experience. In one, the pericarditis was complicated with tubercles and vomicæ of the lungs; in another, with chronic asthma and bronchial congestion; in the third, with petechial small-pox. In all three there was reason to believe, that it came on just prior to dissolution, and in none of them was it the object of clinical diagnosis during life. Andral, *Mal. du Cœur.*—(Obs. v. vi. vii.)

Of his three uncomplicated cases one, which recovered, is not regarded quite with certainty by Andral himself as a case of pericarditis. It probably was so. Its symptoms set in with fever, vertigo, and apparent cerebral congestion, which were followed by severe pain in the præcordial region and epigastrium, and very irregular and tumultuous action of the heart. These yielded to venæsection, and several applications of numerous leeches, and the patient got well.—(Obs. iv.)

Another is a case of exceeding interest. The patient, a shoemaker, thirty-one years of age, was admitted into the "Hôpital de la Charité" on the third day after his attack, and gave this account of himself:—that, three days before, he had been seized with rigor and a general sense of illness, and that during the following night he had much fever, and the next day he felt a very sharp pain in the left breast. The next day, the day of his admission, this pain continued. The following was the record now taken of his symptoms:—Countenance pale and expressive of suffering and inquietude; a sardonic smile from time to time, and a sort of convulsive trembling of the lips. Pain in the præcordial region habitually of no great amount, but now and then becoming much more severe, and then not confined to the seat of the heart, but passing, like strokes of fire (such was the patient's comparison), into the whole left side of the thorax; while at the same time the entire left arm was seized with numbness, which would be exchanged, during a few seconds, for a very sharp pain. Whenever the pain was thus exasperated, and darted in these directions, the breathing was at once greatly impeded, the beats of the heart became tumultuous, and indescribably irregular, the pulse imperceptible, and the extremities icy cold.* But the pain no sooner abated again, than the breathing lost its agony, and became only moderately embarrassed, the beats of the heart were again regular and forcible, and heard over the whole anterior part of the thorax, and the pulse was raised a little, but always remained very small relatively to the force of the heart's impulse. The chest was every where resonant to percussion, and the respiratory murmur was everywhere strong and clear.

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* This sudden agony has already been noticed as incident to rheumatic pericarditis.—p. 154.

What a strange group of symptoms we have here! Distinct paroxysms of angina pectoris following close upon fever and pains, which had newly arisen and seemed to denote acute inflammation! Let us see how it all will end. The disease was yet only four days old, when this was the condition it had brought the patient to.

The great force of the heart's impulse in the intervals of the paroxysms led to the employment of venæsection and numerous leeches, and during the following night the paroxysms of pain were less severe and less frequent. And so they were during the following day, when they returned only three or four times; but they were still of the same character and extent, and still accompanied by the same numbness and pain of the whole arm down to the hand. In the evening, another venæsection was adopted. The next night was good; and on the next day the report was given in these few words—"almost the same state." Nothing could well be more promising than the patient's condition on the ensuing day, which was the sixth of his disease. All pain was gone. His aspect had become more natural. The impulse of the heart was of less force and less extent. The beat of the arteries, however, was still extremely small. But now came the change. A few hours after the physician's visit, without any return of pain, great dyspnœa arose, which went on increasing until the next morning; when the pulsations of the heart, which had all along been so energetic and forcible, could scarcely be heard within the chest; and the beat of the arteries was smaller than ever, and the entire præcordial region and a considerable space beyond it were dull to percussion. The horizontal posture was impossible, and as the patient sat erect, he could scarcely utter a few intelligible words in a gasping voice, and express that he felt as if a chain of iron was being drawn tight round his chest, and was suffocating him. He died in the night.

On dissection, the bag of the pericardium was found distended with blood. It contained nearly a quart of a brownishred fluid, having the sensible qualities of blood drawn from a vein. The internal surface of the pericardium was lined with membranous concretions stained red. No other parts of the body had undergone any change, save what belonged to sanguineous engorgements and congestions, which were evidently secondary.—(Obs. iii.)

A woman, twenty-six years of age, mother of two children, and having lately suffered a miscarriage, was admitted into La Charité in such a state of delirium as made it impossible to gain from her any information respecting her previous condition. She preserved an obstinate silence, and, being interrogated, put on a fixed look, but answered nothing. Her face was pale, and her lips were kept apart, and agitated from time to time with a convulsive trembling. Her pulse was frequent and small, and her skin had little heat. The two next days there were observed frequent tossings of the head backwards, and sudden jerking of the trunk upwards, and twitching of the tendons. She spoke, and seemed to understand; but her discourse was full of incoherence. Her pulse was intermitting, as well as very frequent. On the following day, the fourth from her admission, the delirium ceased, and she only complained of great weakness; but the muscles of the face were almost continually agitated with convulsive movements, and the upper extremities presented from time to time a cramp-like tetanus. On the fifth day the delirium returned; the features motionless and changed; the upper extremities being raised, fell by their own weight, as if paralytic; she passed into a comatose state, and died in the evening.

When the body came to be opened, neither the brain nor the spinal marrow, nor their investing membranes, nor the intestinal canal in its entire length, except that here and there it presented a slight injection, nor the lungs, except that they were slightly engorged at their posterior part, nor indeed any other organ, offered a trace of disease; but only the heart. Yet not the substance of the heart, nor any of the vessels coming to it and going from it, but the pericardium alone. The pericardium was lined with albuminous concretions, from which soft bands of adhesion proceeded from one surface to the other, while there were some ounces of greenish flocculent serum in its cavity.—(Obs. viii.)

Now I can only hope that this lecture of details has not drawn too much upon your patience; for I can hardly expect that your interest has kept pace with the recital of cases which I have given from my own observation and that of others. But these cases must be allowed to contain many important facts, which, not being able to reduce them under any general head, I could not have brought forward at all, but as they were exhibited in particular instances. Be it, however, remembered, that all our knowledge was originally derived from cases. And cases must still be noted and preserved, and studied, as records of what we know, until we arrive at more general facts or principles than we have yet reached. For general facts or principles, well ascertained, are found both to comprehend numerous particulars, and to become at the same time their representatives, and so to dispense in some measure with the necessity of detailing them.

The subjects of our profession require to be treated summarily or in detail, according to the degree of light that is brought to bear upon them from a general pathological principle. If you enter a spacious room with a small taper, you must carry it about, and pick your way with it into corners and recesses, and round pillars and projections, and after all you will hardly know where you are, and will be lucky if you escape accidents. But if you enter the same with a bright burning lamp, you have only to place it on a pedestal, and then stand in the midst and look around; and then you will find all things, great and small, near and remote, brought out equally to view, and will at once understand and admire the beauty and proportions of the whole apartment.

So it is with our clinical inquiries. We must deal much in detail, we must note cases one by one, while we yet want a great pathological principle, which can show their natural relations and reconcile them together. But once establish such a principle, and it will compass and illustrate perhaps a hundred particulars at once, and render their minuter examination needless and superfluous.

LECTURE XVIII.

IMMEDIATE RESULTS OF ENDOCARDITIS AND PERICARDITIS.—REPARATION OF THE INJURY DONE TO THE HEART.—PERFECT AND IMPERFECT.—THOUGH IMPERFECT, IT MAY SAVE LIFE.—CAUSES WHICH HINDER OR POSTPONE REPARATION: 1. THE AMOUNT OF INJURY TO THE HEART ITSELF; 2. THE AMOUNT OF CONCOMITANT INJURY TO OTHER ORGANS; 3. ORIGINAL WEAKNESS, OR PRAVITY OF CONSTITUTION.—ALLUSION TO CERTAIN AFFECTIONS OF THE BRAIN AND SPINAL MARROW INCIDENT TO THE PERIOD OF REPARATION.

OUR attention has thus far been occupied with acute inflammation of the heart, as it is found in those structures of the organ which are its most frequent seat; and we have dwelt especially upon its clinical diagnosis, and its clinical history, and its medical treatment.

Its clinical diagnosis is, perhaps, as nearly perfect as it is possible to conceive of any internal disease. The fact of its existence, even as soon as it begins to exist, and the discrimination of its exact seat, whether in the endocardium or the pericardium, are brought to an almost certain calculation.

Its clinical history is less perfect than its clinical diagnosis; but it will probably be enlarged by future research, teaching us more of the conditions, both external and internal, which conduce to it. What, however, it has already disclosed is most valuable. It has shown that endocarditis and pericarditis are no isolated pathological facts, but that they claim a natural alliance with well-known forms of disease in other parts of the body, and in the constitution at large.

Its medical treatment can hardly be thought to have reached all the certainty and success of which it is capable. But, so far as it is successful, it claims for endocarditis and pericarditis (not less than their clinical history claims for them) a common pathology with inflammation in all other parts, showing that they both need and bear the same remedies, and that they admit from them the same impressions, whether for palliation or for cure.

From what, then, has hitherto been seen of diseases of the heart, it will appear how far they stand alone, and how far they do not. They stand alone in the forms and modes of their manifestation, but in their essence they have a pathological unity and a common principle of treatment with the diseases of other parts; they owe their exclusive forms and modes of manifestation to the structure and functions and sensibilities proper to the heart, of which no other organ in the body has the like: they owe their unity of essence and their common principle of treatment to the one vascular system, the one nervous system, and the one nutrient and assimilative system, which belong to the heart as they do to all other organs, and which carry on the work of health and the work of disease there and every where.

These are truths too well known to be dwelt upon. I only here set them up as cautionary notices, while we still pursue our inquiry into diseases of the heart, not to lose the links connecting them with those of every other organ of the body.

Of acute endocarditis and pericarditis, under the circumstances in which alone we have any familiar experience of their occurrence, viz. in connection with rheumatism, the fatal cases were few; but the cases of perfect recovery, as far as our observation reached, were few also. Of ninety cases, death took place in three only. But of the rest it was only in seventeen that we could feel any thing like an assurance of perfect recovery.

What, then, became of the seventy cases which remained? The patients were kept in the hospital until they had reached, it was thought, a state of present security; and then they were discharged, and lost sight of altogether; believed to be safe but known not to be sound.

Our acquaintance with the seventy cases in question ceased at a most interesting point. The most vital organ in the body had suffered inflammation. The inflammation was gone, but the organ was still damaged. Life was safe, but recovery was imperfect. This, I say, was a most interesting point, whether we looked from it backward or forward. In some we had good reason for gratulation, in some for disappointment. Looking backwards upon all the fears we had of the severer cases, we were content that life was merely safe when we expected death: and looking backward upon all the hopes we had of the milder cases, we were dissatisfied that life was merely safe when we expected complete recovery. And now in all, safe as they were for the present, looking forward and thinking what was to become of them, we found them invested with a new interest prospectively; and at this point of new interest we lost sight of them. The poor patients remained under our observation and care for the longest period that the regulations of the hospital would allow, and then they returned to their customary occupations, whatever they might be, and followed them as best they could.

What may be the ultimate fate of these cases will serve for our speculation hereafter. The fact of their present safety is momentous enough to have a little further consideration now bestowed upon it.

This state of present safety was sometimes easily and quickly reached, and sometimes hardly and slowly; and the process of reparation conducting to it was full of eventful circumstances.

But what is reparation? It is neither health nor disease; but it stands midway between them, and partakes of the nature of both. Now it is nearer to one, and now to the other; now ready to fall back into disease, and now to go forward into health. Truly this reparation demands as much of the physician's care as either of the other two; for it has its aids and its hindrances, which it is our business to study and to interpret; its aids, that we may apply them and cherish them, and in every way make the most of them; its hindrances, that we may intercept them or lessen them or counteract or annul them altogether.

Unquestionably it does often happen, even when vital organs are concerned and inflammation has materially injured their structure, that, as soon as it is fairly arrested, the patient is safe for the present. There may yet remain a great deal to be done before he is either entirely well, or as well as he ever will be; but already there is no anxiety about his life. On the er hand, it often happens, when vital organs are concerned, l a material injury is done, that though the inflammation ve come to an end, life is still in jeopardy. It is not enough t the disease, as an active, moving, mischief-working process, ve ceased, reparation has to take its place, and to make some l progress before the patient is safe from day to day.

Inflammation of the heart in its several forms furnishes amples of both these issues, and happily of one much oftener n of the other. Simple endocarditis is by far its most fre- ent form : and of simple endocarditis the cases in which the ger, whatever it has been during its progress, entirely ses away when the inflammation ceases, are the vast majority, l those in which it remains are the very few. But of simple icarditis, and of pericarditis combined with endocarditis, the es in which the danger passes away are the few, and those which it remains are the many.

Seldom to endocarditis, oftener to pericarditis, and very en to the complex of both, there succeeds an interval of rs, or of weeks, even of many weeks, during which it is still btful whether the patient will live or die.

Now there is no more obvious and intelligible cause of life ng left or not left in a state of present safety, or near to it far from it, than the mere *amount* of damage done to the rt by the by-gone inflammation. After the subsidence of ple endocarditis, the endocardial murmur will often remain loud or louder than ever, showing that the damage done tinues, while at the same time there is no other attendant dition which denotes the smallest danger. Surely in such es there is reason to believe that the damage is small, con- ing in those little beads of lymph deposited upon the free e of a valve, which dissection discloses as the effect of acute ammation. And, though there be no reparation of this ll damage either now, or for weeks or months to come, life he mean time is perfectly safe. No doubt from the valvular oundness produced by endocardial inflammation, though ll in degree, there *is* a danger, but it is not yet; and it is the sake of preventing this remote danger that its perfect aration, small as it is, is especially desirable, and not for the e of present safety.

But, after the subsidence of simple endocarditis, the murmur which remains will in rarer cases be accompanied by conditions that bespeak danger, by excess of impulse and by præcordial fluttering and by extreme anguish. And here it may be believed that a greater damage has taken place. For acute inflammation of the endocardium can do more than deposit specks of lymph upon the edges of a valve; it can spread a layer of lymph over a great superficial extent, even (as I have seen) throughout an entire auricle; it can accumulate masses of lymph as large as a pea or a cherry-stone, or larger, and leave them pendulous into the cavity of the ventricle; or it can destroy half a valve by ulceration, or carry away a long strip of the membrane, and lay bare the muscular substance; or, (as I have known,) it can penetrate from one auricle to the other, and lay them both together. Here are some forms of injury too destructive to admit any such degree of reparation as will allow life to go on at all; and here are others not destructive enough to make such reparation altogether impossible, but only capable of it slowly, and likely to keep life in jeopardy until it is accomplished.

Acute pericarditis being more frequently fatal than endocarditis, dissection has made us more familiar with the nature of the organic injuries which immediately follow it. Their forms and degrees are quite enough to account for the many various events familiar to clinical observation. There is that organic injury which is too great to be borne, and which must kill at once, and there is that which is too small to bring life into any present hazard. In one case there is no surviving it, the injury is so great, and in another there is no dying of it, the injury is so small. And as in pericarditis there are many degrees of organic injury lying between the greatest and the least disclosed by morbid anatomy, so between present death and present safety there are degrees and vicissitudes of suffering, known to clinical observation, which may come sometimes nearer to one, and sometimes nearer to the other.

Now some clear notion of the real detriment done by pericarditis, and of the much or the little that remains to be repaired is needed to help us in understanding what its reparation must be as a living process, and why it is so difficult and so precarious in some cases, and so easy and so sure in others. Coagulable lymph adhering to the surface of the pericardium, and fluid effused into its cavity, each of various amount and of various relative proportions in several instances, constitute the material results of recent acute inflammation. The coagulable lymph adhering to the surface may be deposited in distinct and broken patches, or it may assume the form of an adventitious membrane. The adventitious membrane may cover a small portion only of the pericardium, or it may serve as a complete lining to it, following its reflections both where it is loose and over the heart itself and over the large blood-vessels.

This lymph varies in consistence, from the least possible degree of tenuity, which can preserve a continuous texture, to the thickness of more than an inch. On one side, where it is applied to the pericardium, its surface is uniform; on the other it varies. Sometimes this latter is dotted all over with minute apertures or pores at regular distances, which give it a reticulated appearance, like delicate net-work. Sometimes it is intersected with lineal elevations, forming a grosser reticulation, not unlike the second stomach of the calf. Sometimes it is studded with minute tubercles; and sometimes rendered rough and very unequal by partial accumulations of soft flocculent matter upon it, like large pieces of sponge, or tow.

From the slight red tinge often observed in this adventitious membrane, it might be suspected that blood-vessels are continued into it from the pericardium. From its capacity of receiving injection from the coronary arteries, it is certain that they are so.

The fluid effused into the cavity of the pericardium in consequence of inflammation, varies very much in quantity: sometimes it does not exceed the quantity of fluid ordinarily found there; but its appearance will always show it to be the product of disease. Nearly four pints are mentioned, upon good authority, as having been found in a case of inflammation. I never found more than half as much. This fluid is sometimes of a clear lemon colour, and transparent; sometimes less transparent, from an intermixture of filamentous flaky or membranous substances; and sometimes not at all transparent, but, like unstrained whey, from an intermixture of pus. In different cases it presents every tinge of red, from an intermixture of blood in various proportions, and sometimes it is a mere turbid serum.

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Here is detriment enough done to the natural and healthy structure of the pericardium. Here are substances enough superadded to its natural and healthy substance. But even to the eye of the anatomist they bear the characters of transition and variableness, and not of permanency. They contain the evidence of *something in progress*, which death has arrested. Had life continued, either disease would have increased them, or reparation have lessened them. They could not have remained as they are. What death *has* in truth arrested, is either the growing fabric of disease, or the growing work of reparation; for these are the appearances found, when life is cut short, while we are still employing active remedies for active symptoms, the symptoms (we believe) of inflammation. And these too are the appearances found, when active symptoms *have* existed, but are now gone, and active remedies *have* been used but are now abandoned, and inflammation (we believe) has ceased; and yet life is cut short while we are helping the faint efforts of the constitution, and still waiting and hoping for reparation to reach the point of present safety.

What is thus shown to be true of endocarditis and pericarditis, when each is taken alone, is, without further explanation, at once seen to be true of them when both are taken together. It is simply this, that the different amount of organic injury remaining, after the inflammation has ceased, is one sufficient reason of reparation being found quick or slow, easy or difficult, in different cases, to reach the point at which life shall be safe.

These are matters plain and obvious enough, it is true. Nevertheless they need to be strongly insisted upon, for they have an important bearing upon practice. In every case of cardiac inflammation, think of its local effects, and then strive by all means to cure it, and above all, strive to cure it *quickly*. For the longer it lingers, the greater will be the amount of organic injury which it leaves behind, and the greater the likelihood that a painful precarious period will succeed before life is safe.

But besides the absolute amount of injury done to the heart itself, whether small or great, other conditions, just as plain and palpable, often exist elsewhere, which have a share in determining how soon or how late, with what ease or what difficulty that measure of reparation shall take place, which is to put the life of the patient in safety again.

The coincidence of inflammation of the lungs with inflammation of the heart* has been already pointed out. That inflammation may be of any or of every pulmonary structure. It may be bronchitis pneumonia or pleurisy; one of them alone, or two of them, or all of them united. And these, when they so occur, are apt (it will be remembered) to run on to those terminations which we most deprecate, to large bronchial effusion, to large pulmonary congestion or hepatization, and to single or double hydrothorax or empyema.

Now, as the life of the patient was doubly jeoparded by the coincident inflammation of the two vital organs while it was yet in progress; so, when it has come to an end, the remaining organic injury of both makes the work of reparation longer and more difficult, and postpones the safety of the patient to a more distant day.

But, as the peril of inflammation, while it is yet progressive, is not always in exact proportion to its extent within the part, so neither, when it is brought to an end, are the chances of safety and reparation to be measured absolutely by the amount of the material injury done.

The whole body has to do with the health of its single parts, and it has to do with their diseases also, in originating and maintaining, in arresting and repairing them. Look to the mere matter and bulk of things, and think only of what is visible tangible and audible in parts, and you will come to strange conclusions: you will see people die of too little to kill them, and see people survive what is enough to kill them twenty times over. But if, in such events, you would know what it is that *mainly* kills, and what that *mainly* saves, you must look out of the part into the constitution at large: you must do so especially in diseases of the heart.

It goes hard with weak, scrofulous children, and with men and women whose habitual health is no better than an habitual infirmity, when they come to suffer inflammation of any vital organ: but it often goes still harder with them after the inflammation has ceased, if much be left for reparation. Subjects of this unhappy constitution will struggle through a combined attack of inflammation of the heart and lungs, and hold out well until it has come to an end, and will afterwards die during the halting, ineffectual efforts of reparation, or only after a very long time, and many vicissitudes, will reach the point of safety at last. Their constitution has given all it could to the disease without dying, and it has now not enough, or scarcely enough, left to give for reparation, or, rather, for that degree of reparation which is needed for present safety.

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* Vide Lecture IX.

What that degree is, cannot be accurately told. Yet the habitual health of individual patients will furnish a kind of measure of what it is likely to be in *them*. The worse their natural constitution, the less injury can be borne, and the nearer must the injured organ have returned to the state of its former integrity before their life is safe. This, unfortunately, is as much as to say that the most reparation is needed, where, in the nature of things, the least can be expected.

As it has been chiefly in weak, scrofulous children that I have witnessed this struggle for life, or this state of insecurity, most prolonged after the inflammation has ceased, I shall take from them the type of certain conditions which I wish to describe.

Some, when the time has come that they should show the visible tokens of recovery, have exhibited a perilous prostration of the nervous system, and such alternate rallying and sinking as have kept the bystanders in apprehension of their death for weeks and weeks together. But recovery from this condition is more frequent than death, such a recovery, I mean, as reaches a state of present safety, but still with an unsound heart.

Some, when we have looked for their visible recovery, have sunk into anæmia; anæmia so extreme and so protracted, that with them it seemed as if their food would never again be duly converted into blood. Yet these, too, may, and commonly do, at length reach a state of present safety; but still with an unsound heart.

It is most important to remark that, while this prostration of the nervous system, or this anæmia, has lasted, whether for weeks or for months, reparation has been at a pause. Neither the heart, nor the lungs, nor the pleura, if they happen to have suffered damage, have seemed to make any progress in the mean time towards regaining that degree of soundness of which they are capable.

During the pause of reparation, and in the midst of this nervous failure, or this impoverishment of blood, the feet and ancles are apt to swell, an event which is looked upon as a mere accident of debility, and is hardly taken into account in calculating the fate of the patient. But sometimes this small œdema will rise rapidly into general dropsy, and serum be found wherever it can find its way, filling cavities, and distending the cellular texture throughout the body. Thus, the largest and most pervasive of all diseases, which is commonly reserved as the last fatal result, when the heart has reached the most extreme degree of disorganisation that it is capable of, is sometimes an early consequence of its acute disease, arising partly out of the very damage done by the disease itself, and partly out of the feeble constitution, which it has befallen, being put to a severer trial than it can bear.

But I have seen recovery even from this condition, the dropsy entirely dissipated, the patient again safe, and every organ again free from complaint, except the heart, which has remained permanently unsound.

Yet it may not be either the amount of injury suffered by the heart itself or of concomitant injury suffered by the lungs, or yet the weakness or pravity of constitution which makes reparation a halting, lingering process; it may be none of these that, after inflammation has ceased, still keeps back the patient from the point of safety. Nay, the structural damage may have reached that degree of restitution which should bring security, and yet there may be something less material and less defineable, but fearfully real, which continues to hold life in jeopardy.

Disease is a great physiological teacher. Perhaps it is the greatest of all. It institutes experiments which we cannot imitate, and so tells us many things which, but for it, we should never know. I never laid bare a living brain, a living spinal marrow, or a living heart. I never took up a living nerve with the forceps, or noted the behaviour of these organs severally or reciprocally under modes of irritation which were of my own contrivance; yet, I have read of experiments which I never performed, and never could bear to see; and I may have learnt something from them; something, how dearly purchased!

But above and beyond all knowledge so obtained, there is a knowledge conveyed by the living phenomena of diseases, and by them only. Coincident with symptoms referable to the endocardium or pericardium, in one case there has been maniacal delirium, in another epileptic or tetanic convulsion, in another chorea, in another coma, in another fatuity. The patients have died, and dissection has found the brain healthy, and the spinal marrow healthy, and the endocardium and the pericardium alone inflamed. Now, have all the experiments that were ever done or perpetrated upon living animals given intimation of an influence like this, proceeding from the heart to the brain, and from the heart to the spinal marrow? Has not disease here been our teacher?

All these affections of the brain and spinal marrow, coming on in the course of inflammation of the heart, should be carefully watched and ministered to from the least to the greatest. Wild delirium, epileptic, or tetanic convulsion, chorea, coma, fatuity, are the greatest and the rarest; and mutterings, reveries, transitions from torpor to excitement, subsultus, are the least and the most frequent. But they are all akin one to another. The least may mount up to the greatest, and the greatest run down to the least.

Moreover where any of these have been during the progress of the disease, and the patient has survived, they are liable to be continued or to recur during its reparation. Or they may then arise for the first time, as if they took advantage of the weakness and exhaustion of the nervous system.

A year or two ago I saw a young lady seventeen or eighteen years of age, who had suffered acute rheumatism, and with it inflammation both of the endocardium and pericardium. As active symptoms declined and active remedies were withdrawn, her extreme weakness became apparent. Her nervous system was laid prostrate. Her reason began to totter and in a few days her mind was entirely gone. And thus, still without reason but not without consciousness, living but not rallying, and her vital functions scarcely kept going from hour to hour, she remained for several weeks. At length mind and body recovered together by little and little, and she reached the point of present safety. But neither mind nor body were so far re-established, while she continued under my observation, as to enable me to see to what condition they would permanently revert. The heart beat with some excess of impulse, and with a loud endocardial murmur; and I reckoned on permanent adhesion of the pericardium and permanent unsoundness of the mitral valve. But, moreover, I still feared and questioned what would be the eventual state of her mind, and still looked to some possible evil being engrafted upon her extreme weakness. She was taken home by her parents to the north of England, and her mind was perfectly restored. But after the lapse of a twelvemonth she died of pulmonary consumption.

A young man, twenty-eight years of age, after having suffered rheumatic attacks, which had continued subsiding and returning during eight weeks, came at length under medical care. He was now in a state of fatuity, and so continued until, his strength daily diminishing, in three weeks more he died. "The pericardium was free from disease; but upon the mitral valve, near its edge, there was a perfect row of small slender bead-like warts."* The case is reported by Dr. Watson, and is valuable, among other reasons, especially for this, that it authenticates the pathological connection of these awful affections of the brain with endocarditis. Their connection with pericarditis is the more acknowledged and familiar fact.

The same physician relates another case, which I will abridge. A young man, twenty-four years of age, suffered an attack of acute rheumatism, which was of a shifting character, and confined him to bed six days. Leaving his bed prematurely, he suffered a relapse, and afterwards continued slowly mending until the eleventh day, when he became restless and delirious. Hitherto the symptoms referable to the heart had been equivocal, consisting chiefly of pain. At this time, when Dr. Watson first saw him, he found the heart's disease sufficiently attested by its irregular action, its excessive impulse, and its loud endocardial murmur. But it was the state of the brain, which had now become the great object of interest and apprehension. A sort of stupor, or obstinate taciturnity through the day, passed into distinct delirium at night. Such was his condition for six days, when stupor was exchanged for restlessness, and restlessness for maniacal frenzy with screaming and vociferation. And then tetanic convulsion alternated with coma, and in three days he died. Upon dissection, at a small space of the

* Med. Gazette, vol. xvi. p. 93.

posterior surface of the heart, the pericardium presented an adhesion of recent lymph, and the mitral valve and the aortic valve numerous bead-like vegetations.[*]

Dr. Watson alludes to another case, without describing it. A young woman, nineteen years of age, went through an attack of acute rheumatism, accompanied by inflammation of the endocardium and pericardium: "She lived two months from the commencement of her cardiac disease; during that period she was at times wildly delirious, at times stupid, taciturn, and almost idiotic, and at times quiet and rational."[†]

In one of these three cases given by Dr. Watson, there was no visible trace within the brain of any thing different from healthy structure. In the other two, there was some fulness of the blood-vessels of the brain and some slight serous effusion. Whether these last really partook of the nature of disease, *i.e.* of inflammation; and if so, what share they had in producing the symptoms, I will not stop to inquire.

My purpose is, to make you aware that, when endocarditis and pericarditis have ceased to threaten life in their own way and by their own direct instrumentality and their reparation has already begun, they may yet induce perils of a new kind, and death after a new manner, through the troubled functions of the brain and spinal marrow.

[*] Med. Gazette, vol. xv. p. 94.

[†] Ibid.

LECTURE XIX.

PERMANENT UNSOUNDNESS OF THE HEART FROM THE INJURY DONE BY ENDOCARDITIS AND PERICARDITIS BEING IMPERFECTLY REPAIRED.—CONSEQUENCES.—SECONDARY INFLAMMATIONS.—THEIR CLINICAL HISTORY.—THEIR CLINICAL DIAGNOSIS.—ITS EXTREME DIFFICULTY AND UNCERTAINTY.—SEVERE AND FATAL CASES.—COMMENTARY UPON THEM AT LARGE.

WE have been considering that important period of the clinical history of endocardial and pericardial inflammation which intervenes between the cessation of the disease and the restitution of the organ, not to a state of complete soundness, but to a state compatible with present safety.

But of all organs in the body, the heart can least endure any imperfection of its natural structure; and yet in the vast majority of cases where the endocardium or the pericardium has been inflamed, some imperfection of structure is left behind: hence the great interest which belongs to them prospectively.

Now seventy such cases occurred to me at St. Bartholomew's Hospital in the course of five years. Seventy patients, who had suffered endocarditis or pericarditis or both, were restored to a state of present safety, but not of perfect soundness, and then discharged. It will be by the merest chance that any one of them will ever be seen by me again; yet, could they all have been kept within the reach of medical observation for the rest of their lives, they would without doubt afford some valuable results. But the conditions of medical practice do not allow such lengthened observation of any seventy individual patients. Our own lives must needs last for many generations to furnish us an experience of other men's diseases in their entire course, which last the half or the whole of theirs.

But do not let us make the difficulties of clinical observation under any circumstances greater than they are. Its end, indeed, can never be answered by less intercourse with the sick than is needed to mark each material change that occurs in the progress of the disease: more than this it does not require. Thus when the disease is of an acute kind, and runs its course in five or ten or twenty days, the physician's intercourse with the patient must be daily, and perhaps more than once a day. For every day, and, perhaps, more than once a day, changes are apt to take place, which must be noted as they arise, if they are to be successfully ministered to. But when the disease is chronic, and lasts five or ten or twenty years, this intercourse need not be oftener than at intervals of months, or even once or twice a year; for it is only at such intervals that those changes are apparent which are likely to call for his interference. And these surely are easy terms of making the clinical observation of chronic disease adequate to its purpose. But it is the opportunity of making it even upon these terms, which is so difficult to be obtained. How rarely has it happened to any of us to have numerous individuals the subjects of any given chronic disease, so constantly within our reach, that we could see them and inquire into their condition two or three times a year, for many years together, or for the whole of their lives![*] Thus all I know, and all I can tell, of what is apt to result from the heart left in an unsound state by an attack of by-gone inflammation, is drawn, not from following up any certain number of cases from first to last, but from such accidental experience as in the course of years has fallen to my share, and been furnished by, here and there, a case which I have happened to meet with.

There are some truths in medicine which are based upon numbers and upon statistical calculations, and which thus carry with them the highest proof of their certainty. And there are others which are and only can be picked up piecemeal and by accident; yet these may be equally truths in themselves, though they are not equally known to be so: they may be called chance-truths, lying out of the high road of philosophy; but Philosophy is not wise, if she does not step aside to gather them.

You would wish to know the fate of those who are left with hearts damaged by the effects of inflammation; and could I give you a summary of events drawn from a complete history of threescore and ten cases, I should be giving you both the truth, and withal the highest proof of its certainty. But I can only give you single and scattered notices of events drawn from a partial observation of such cases as have happened to fall in my way. And thus I may still be giving you the very truth, but without the highest proof of its certainty.

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[*] Vide p. 94, for an explanation of the different ways by which we gain our knowledge of acute and chronic diseases.

Such cases, then, as have fallen in my way have taught me, that after endocarditis or pericarditis have left the heart in a state of unsoundness, but life safe for the present, the period to which life may be still continued is very various. It may be a few months only, or a few years; or it may be many years, even ten, or twenty, or thirty.

Of these facts I am certain; but I cannot array them numerically and statistically: and because I cannot, I can determine no relative proportion between those who survive months and those who survive years; or those who survive few years, and those who survive many: yet the facts are sure. And, although they come from casual observation, they admit of being grouped and generalised, and dealt with instructively, and fair reasons may be given for their being such as they are.

Such cases have two principal terminations. Either there may be a renewal of the same disease in the unrepaired structure, or in some other structure of the heart, or, the unrepaired structures remaining as they were left, may become the element of further detriment to the organ, which is different in kind. Each of these results shall be taken and considered separately, and in the mean time it will, perhaps, appear why the course of events, and the duration of life, are so various in those who owe their unsoundness of heart to a common cause.

Each of these results shall (I say) be considered separately; for, although they are found mixed together, the things themselves are separate in kind. The one, the secondary inflammation, partakes of the nature of an accident; the other, the progressive disorganisation, springs from an inevitable tendency. The thing of accident may or may not be added to the thing of nevitable tendency at any period of its growth. Fresh inflammation may or may not arise in the heart already unsound, and ending to further disorganisation.

Let us first consider the clinical history and clinical diagnosis of the incidental secondary inflammation.

Whoever has had his heart once inflamed (whether it be the endocardium or pericardium which is the seat of disease) and left thenceforth permanently unsound, may have it inflamed again, and he may die of the second inflammation as he might have died of the first, or he may escape with his life as he escaped before. And not once only, but again and again, his heart may be inflamed afresh, and in some of these attacks he may die, or he may struggle through them all and reach a state of present safety for the twentieth time.

This renewed inflammation may be either of the endocardium or of the pericardium, or of both. It may arise, as it did at first, out of an attack of acute rheumatism; or, though it came at first from acute rheumatism, it may come independently of it afterwards.

Remember, acute rheumatism is (if we may so speak pathologically) the great parent root of inflammations of the heart. It is also, undoubtedly, one of those diseases for which men are found to have a constitutional proneness. When it has been once suffered early in life, there is a fearful likelihood that it will be oftentimes suffered again. Moreover, the first attack is generally the type of every attack which is to follow. They may not all be equally severe, but they will all take the same course, and involve the same structures. If the first involve the heart, so, probably, will they all. Thus, the thought of a healthy child first seized with acute rheumatism is full of sorrowful forebodings. Its heart is very likely to be inflamed, and it may die: but, whether it die or not, its heart is very likely to be damaged for life. Having had acute rheumatism once, though it may perfectly recover, it is very likely to have it again; and, whenever it again has acute rheumatism, it is very likely again to have inflammation of the heart as its accompaniment.

But, certain causes, which are not apt to produce inflammation of the heart *de novo*, are found capable of renewing it in its half-repaired condition. A single exposure to cold, a single act of intemperate indulgence, or some unusual bodily effort, in a man of unsound heart (unsound from the effects of former inflammation), will sometimes bring life into jeopardy, and sometimes kill; and, dying, he will disclose in the endocardium, or the pericardium, indubitable traces of a new inflammation, mixed with the effects of the old.

Still, if what I have seen may be taken to represent what generally happens (for I have no statistics to appeal to in this matter), when the unsound heart is re-inflamed, it is almost always in consequence of a fresh rheumatic attack; but it is not exempt from the possibility of being re-inflamed by other causes.

There are some other circumstances belonging to the clinical history of this secondary inflammation of the heart which deserve to be mentioned. Like its primary inflammation, it also is apt to be associated with pulmonary inflammation, with genuine pneumonia, with bronchitis, with pleurisy. Then, as to the secondary carditis itself, it may be either of the endocardium or of the pericardium, or of both. Of these structures, when both have been formerly inflamed, and both left in a state of imperfect reparation, one alone, or both simultaneously, may be inflamed again; or, when one only has been formerly inflamed, and left in a state of imperfect reparation, it may be that the other, which was then unaffected, is that which is now inflamed. In this case the inflammation, while it is secondary as belonging to the heart, is still primary in respect of the particular structure which it attacks.

Such, as far as I know, are the conditions under which fresh inflammation is apt to arise in a heart which previous inflammation has left unsound. Such is its clinical history; we now come to its clinical diagnosis.

Inflammation of a heart previously unsound does not submit itself to so easy and sure a diagnosis as inflammation of a heart previously healthy.

Diagnosis is greatly helped by contrast. Where yesterday there was perfect health and to-day there is disease, a transition has taken place from opposite to opposite. All we see, and all the patient feels, is full of novelty and surprise; and, that disease is involved in the change, we know at once, and we soon find out its nature and its seat by a closer scrutiny. But, where yesterday there was not perfect health and to-day there is disease, doubtless here, too, a change has taken place, yet not so marked a change that either the patient from what he feels, or the physician from what he sees, can be sure that morbid actions of a new and fatal tendency have arisen which were not there before. Thus inflammation will often make secret progress under cover of an habitual infirmity.

Organs that are unsound of structure are often in pain, and often baffled in function, and, where new disease befalls them, how otherwise can they betray it but still by pain and still by irregular function? The heart that has a valve thickened and an orifice contracted, or its pericardium adherent, is apt to suffer pain, and to palpitate and beat out of time. And, when in this condition inflammation assails it, it cannot do more than still suffer pain, and still palpitate, and still beat out of time.

Well! but the heart will *then* do all this in excess, and the excess, you may think, will surely be a sufficient token of the new disease which has supervened. Not so surely as you may imagine. There are no certain measures of pain, of palpitation, and irregular action, annexed to a given amount of unsoundness in the heart. These are ever varying between the least and the greatest degrees, while the heart's unsoundness remains exactly the same. The natural sensibilities of the organ render it obnoxious to a multitude of impressions, some from without and some from within the body, some appreciable and some not, which are perpetually disturbing its feelings and its functions in its state of health. And how much more is this likely to be the case in its state of unsoundness! And if so, then surely of inflammation ingrafted upon this unsoundness, the mere excess, to which we allude, must be a most precarious token.

In short, it is a general truth, never formally declared perhaps, but well worth our notice and of great practical importance, that organs must be previously sound to show clearly the nature of the injury or malady which they suffer, and that, in proportion as they are unsound, they are spoiled for giving true expression to the ills which afterwards befall them. The brain, the lungs, the kidneys, the abdominal viscera, being previously sound and healthy, proclaim themselves inflamed at once. But the brain, with a clot of blood lodged within it, tuberculated lungs, granulated kidneys, a scirrhous stomach, an ulcerated bowel, have their functions and sensibilities in utter disorder and confusion, and are not in a condition to give requisite notice of a new inflammation. A broken instrument is ever out of tune: whatever key you touch, you can never bring out the right note corresponding with it.

But in the heart, you may say, there are always the auscultatory signs to look to. In default of all others, these have been often found enough to settle our diagnosis. Can they do as much now? Are they now self-sufficient? Are they even auxiliary? No; they are neither; they even fail us altogether. In the first inflammation of the sound heart, they were every thing. In all after inflammations of the unsound heart, they are nothing. This is the fact, and it is readily explained.

In the first inflammation of the pericardium, there is the exocardial murmur made by the moving of its roughened surfaces upon each other. But in after inflammation of the pericardium, exocardial murmur there is none, and none can there be if its surfaces adhere completely. And if they adhere partially and there be a murmur, it will not have the proper attrition in it, and so will want the exocardial character. In the first inflammation of the endocardium, there is the endocardial murmur, made by the recent lymph deposited upon a valve; and the murmur continues ever afterwards, when the valve so far falls short of perfect reparation as to remain thickened or puckered. And then in after inflammations, observe the puzzle. There is the permanent murmur of the old unsoundness and the recent murmur of the new disease; but how much is due to the old, and how much more to the new, is too delicate an affair for the nicest ear to discriminate.

But all that has been said still waits for its confirmation by cases. And the cases which I am about to relate are chiefly fatal ones. For so much doubt and perplexity confessedly hang over the clinical diagnosis of these secondary inflammations of the heart, that no fair illustration can be given of them without the proofs afforded by dissection after death. Let it not, however, be therefore inferred that the fatal cases are the most frequent. My impression, on the contrary, is that the secondary inflammation, whether of the endocardium or the pericardium, is rarely fatal. It may add sometimes a little and sometimes much, and always something to the permanent unsoundness of the particular structures, yet it seldom produces present death, but leaves it to arrive at last from the gradually and slowly increasing disorganisation of the entire heart.

In presenting the few cases necessary to illustrate our present subject, I must be allowed to comment upon them as I go along. For it is of no use relating cases at all, unless you may take them in pieces and examine them as men do models in a workshop.

In the following case an attack of acute rheumatism, two years before, had been accompanied by inflammation of the pericardium, which had left the heart permanently unsound. A fresh attack of acute rheumatism was accompanied by inflammation of the endocardium, which proved fatal.

Amelia West, aged 22, was carried into the hospital, September 24th, 1836. Her countenance was pale, her skin hot and perspiring, her tongue furred and bordered with red at the edges, and streaked with red down the centre. Her pulse was 120, and very full and hard withal. Many of her larger joints were greatly swelled and very painful, and upon the skin, covering some of them, was a blush of red. Her respiration was short and difficult, and her heart beat with an excessive impulse. Her whole chest (she complained) was bound so tight that it could not expand, yet auscultation found nothing amiss in the lungs; and in the heart it only found what was already evident to the touch, an excessive impulse. It detected no unnatural sound.

Such were her present symptoms. Her previous history, bearing upon her present condition was this,—she had suffered two severe attacks of acute rheumatism before, and this was the third. The last, two years ago, was accompanied by an affection of the *chest*, for which she was bled. Her present attack began with wandering pains, which followed an exposure to cold, a month ago. These, together with sickness and headache, continued, and showed neither increase nor abatement until five days ago, when fever was lighted up, and the joints began to swell, and the heart to palpitate, and the respiration to fail, and all had been becoming worse and worse from that time forth until now.

Here was perilous disease in progress: but where was it, and what was it? Our auscultation excluded the lungs: it must then be in the heart. The inordinate impulse and all the attendant anguish, arising and increasing as the acute rheumatic symptoms arose and increased, seemed to determine that here must be its seat. But was it inflammation, and in what *part* of the heart was its seat? The mere excess of impulse and the severe anguish, did not settle the questions. Symptoms may be very striking and prominent in themselves, and yet be very indefinite in what they denote. And such were these. But further assuming (as it was practically right to assume, and we did assume) that the disease was inflammation, either of the endocardium or the pericardium, was it ingrafted upon an unsound heart, or had it come *de novo* in a sound one? And this we could only determine by learning in what state her last rheumatism had left her, and her present rheumatism had found her. But the poor patient was too simple and too ill to give any intelligible account of the matter; and we knew nothing of her until we found her in her present perilous condition. Nevertheless, from the fact that in a former attack of rheumatism, the chest was so affected as to need bleeding for its relief, we ventured to consider the present inflammation (if inflammation it was) ingrafted upon an unsound heart.

But to proceed with the case. Here were symptoms not to be trifled with. The fever ran very high. The proper rheumatic symptoms and all that concerned the joints were very severe, and very severe too was all that concerned the chest, and, if it were inflammation, very perilous and very rapidly progressive. The dyspnœa and præcordial anguish called for immediate relief by some remedy capable of a present impression. Accordingly for this a full cupping was practised. Also the renewed inflammation was to be abated, and ultimately abolished. Accordingly mercury was directed, with a view of bringing the constitution as soon as possible under its influence, and ten grains of calomel immediately, and ten grains of calomel on the following morning, were given, united with opium.

The dyspnœa and tightness of the chest were at once greatly diminished, and the respiration suffered no urgent distress for the five following days. But no restraint was yet put upon the violent impulse of the heart. Diarrhœa arose on the third day, and interfered with the further use of calomel, and so Dover's powder was employed to meet the urgency of this particular symptom, as well as to quiet the nervous system.

On the fourth day the gums were decidedly sore, and swollen, and the tongue was loaded with a yellow fur. The proper rheumatic symptoms were nearly gone, and the symptoms belonging to the chest, were restricted to the heart, which beat with more violence than ever, but still without any unnatural sound.

On the fifth morning, after a night of much sleep, she was said to wake much more comfortable, and so to continue until noonday, when suddenly the breathing became very short and painful, and the nostrils were dilated at each inspiration, and the countenance betokened great distress. The heart continued to beat with the same violence, but with less frequency, and now for the first time with a slight systolic endocardial murmur. The gums were very sore. A mustard cataplasm was applied to the chest, and the Dover's powder was continued. The cataplasm gave great relief.

On the sixth morning, it was found that the relief of the chest procured by the cataplasm, had continued through the night, until nine in the morning; and then she became faint, and all the distress of yesterday returned, and with it a cold perspiration, and a sad struggle to dislodge some scanty phlegm which vexed the trachea. The heart beat both with less force, and less frequency, and no endocardial murmur was perceptible. The mustard cataplasm was re-applied, but no relief followed.

On the seventh morning, after a night of agonising distress, she was bathed with cold perspiration; the trunk of the body was bent upon the knees, and thus she was contending for breath, and striving to clear the throat by an effort of coughing, but in vain. The heart was beating feebly and tumultuously, but without unnatural sound. Yet in this condition she struggled through another night, and at nine o'clock the next morning, after lying an hour upon her back, she expired.

It was matter of interesting speculation what would be found on examination after death. As far as auscultation could be trusted for negative results, it showed that the lungs had no share in the disease. Symptoms referable to the heart, viz. pain and inordinate impulse, which arose with the new rheumatic attack, and afterwards continued, pointed to this as the organ affected. But these symptoms were not enough to denote either the nature or the seat of the disease. A systolic endocardial murmur which came one day, and was gone the next, —viz. the day before the patient began suddenly to sink,—was the only symptom to suggest that the seat of the new disease was the endocardium.

Both lungs had contracted extensive and very intimate adhesions to the ribs anteriorly. The left pleural cavity, where it was free, contained about three ounces of serum. The lungs and bronchial tubes were healthy. The pericardium was universally and closely adherent to the heart. The intervening matter was thick, and at some parts as condensed, and as hard as cartilage. Both auricles were greatly dilated and choked with coagula. The right ventricle was simply dilated in a moderate degree; the left ventricle both greatly dilated and greatly hypertrophied; and in its large carneæ columnæ were some peculiar deposits giving them the appearance of grained oak. The lining membrane of both auricles was opaque and thickened. Both the tricuspid and the mitral valves on their auricular aspects, and near to their edges, had numerous beads of lymph growing from the surface, but leaving it entire, when they were picked off by the forceps. In the mitral valve they formed almost an entire circle: on the tricuspid they were fewer. Among them there were some that had become much larger than the rest, even as large as a pea, and were loosely pendulous into the ventricle. The auriculo-ventricular orifice had not on either side of the heart undergone any obvious contraction. Both the pulmonary and aortic valves were free from disease.

The liver was enlarged, and congested with bile and blood. (W. xx. 121.)

The next case, as it ran on speedily to its fatal termination, gave a short, and striking, and rapid proof, how the previous unsoundness of the organ can mar the diagnosis of its subsequent diseases.

An attack of acute rheumatism, a year and half before, had been accompanied by inflammation of the pericardium, which had left the heart permanently unsound; and a fresh attack of rheumatism produced fresh inflammation of the pericardium, which killed. The symptoms plainly belonged to the heart, and plainly showed that it was most perilously affected. But they were not definite enough, either to characterise the nature of its disease, or to denote the texture of the organ which it occupied.

William Bean, aged 12, was admitted into the hospital, December 16th, 1833, and died on the evening of the 19th. His symptoms on admission were these:—skin hot and dry, tongue moist and white, pulse 140 and jerking, swelling and slight redness and pain of the right wrist and hand, but of no other part of the body: breathing hurried and short, with a slight cough: pain in the præcordial region, increased by pressure between the ribs, and by deep inspiration; excessive impulse of the heart; inability to lie on the left side. Auscultation found the lungs admitting air freely in every part, and at a circumscribed spot beneath the cartilages of the third and fourth ribs on the left side, the systole of the heart was heard, accompanied by an unnatural sound of an indefinite kind. The sound was lost when the stethoscope was removed from this spot in the least degree.

The history of the present attack could not be made out with all the exactness which was desirable. The boy's father, and mother, and himself, were all in a different story as to when he was taken ill, and whether his chest or his limbs were affected first. The poor often take small account of what they or their children suffer short of their being absolutely incapacitated; and this very circumstance is apt to operate as a bar to the information we seek in many an interesting case. But we who know the poor are not surprised at it. They do and must endure daily a measure of (what we should think) physical evil; but habit naturally blunts their perception of it to themselves, and their sympathy for it in others. And well it is that it is so.

Thus much, however, as to our present case, was pretty certain, that the rheumatism had existed a week at least, and the symptoms referable to the heart several days; that the rheumatism had occupied the knees and ancles of both lower extremities as well as the hand, and now might be considered on the decline; and that the symptoms referable to the heart (which were in truth habitual symptoms of long standing now greatly aggravated), had been becoming daily worse and worse. It appeared, too, that the attack commenced with a *rigor*, followed by heat and perspiration.

The history of the patient's previous state, so far as it bore upon his present condition, was simply this. The boy had suffered acute rheumatism a year and a half ago, and from that time he had never been free from palpitation and uneasiness in the region of the heart, which he had not experienced before.

The progress of his symptoms during the brief period which intervened between his admission and his death, and their treatment, it will be enough to state succinctly.

Six leeches were applied to the region of the heart, and three grains of calomel, and a quarter of a grain of opium, ordered to be given every six hours.

He was visited at 8 o'clock P.M. on the same day, and found dozing. He had been delirious in the course of the afternoon, but had derived some relief from the leeches, and was now quite collected.

The next day, the bowels suffering irritation, the dose of calomel was reduced from three grains to one, and a drachm of strong mercurial ointment ordered to be rubbed in night and morning: after forty-eight hours from the time of his admission a great change had taken place; the pain and swelling of the hand had ceased entirely; the fever was almost gone. There had been two nights of sleep and two days of quietude: even the pain referable to the præcordial region was uncomplained of, until it was provoked by pressure, by deep inspiration, or by lying on the right side. Then the pain was there still.

It may be remarked, that the murmur which on our first examination was heard at the cartilages of the third and fourth ribs, was never afterwards heard either there or any where else.

Thus it could not be denied that the active symptoms of the disease were abated, and the disease itself was probably brought to a pause: but there was no sign of rallying withal. The air passed uninterruptedly through both lungs, still the respirations were 64 in a minute. The heart was almost without pain: still it beat tumultuously, and 150 strokes in a minute. It is a bad omen when disease declines, and yet is followed by no token of returning health; there is then a fearful expectation of what may come next. Every function of heart, and brain, and blood-vessel, and nerve, was ebbing and running down, but death not yet in sight, though surely nigh at hand.

On the morrow, the 19th, the third day from his admission, at 11 A.M., he was found with features collapsed, and lips blue, and forehead covered with perspiration, and coughing up a scanty mucus, tinged with blood. Respiration 60, and unequal; pulse 164, and small as a thread; yet the heart and the carotids bounding vehemently; the præcordial region quite free from pain. We tried to make an auscultation of the heart, and especially of the lungs, but he could not bear it, and we desisted. At 2 P.M. countenance was more dusky, and lips more blue, and respiration more distressed. At 6 P.M. hands and feet cold, respirations 72, pulse countless; yet the impulse of the heart was still great: he was still rational, and free from pain. At 8 P.M. he shrieked out from sudden severe pain, as from spasm, and in five minutes he died.

On examination after death, the cavity of each pleura was found to contain four ounces of serum, while the membrane itself appeared healthy. Both lungs were gorged with blood, and their lower lobes were becoming hepatised, and loose of texture, and yielding to the pressure of the fingers. The heart occupied an unusually large space in front of the chest. There was no trace of disease on the pericardium exteriorly; but being laid open, it disclosed the distinct results of two inflammations occurring at distant periods; viz. certain spaces of such close and intimate adhesion, that its separation was impossible without either tearing the heart or tearing the membrane, and certain spaces intervening between these of a loose adhesion, by means of soft flocculent lymph, largely accumulated upon its opposite surfaces, and reaching from one to the other; this lymph was mixed with serum and blood, from which it had taken a stain of red. The muscular substance of the heart bore not any mark of disease, neither did the internal lining, or the valves.—(M. 19, 130.)

Cases need not be further multiplied (the two which have been related are quite enough) to show the uncertain diagnosis and possible fatality of inflammation, renewed by a fresh attack of rheumatism in the endocardium or the pericardium of a heart which has been left unsound after a former attack.

But the inflammation does not require an attack of rheumatism to renew it; it will be enough just to give the outline of a case in proof of this; a case where endocarditis and pericarditis arose, during the progress of acute pleuro-pneumonia, in a heart which had its pericardium already adherent. Here the mixture of equivocal circumstances, and the complexity of the disease threw a veil over one half of it at least, and the patient was believed to have suffered, and to have died of pleuro-pneumonia, and pleuro-pneumonia only, until dissection disclosed the traces of recent inflammation both without and within the heart.

Elizabeth Broom, aged 18, was admitted into the hospital May 30, 1836. Fever and frequent pulse, and dyspnœa, and cough, and glutinous rust-coloured sputa, at once gave intimation of pneumonia, and auscultation presently confirmed the same; for a bronchial respiration and a bronchial voice proceeded from the greater part of both lungs behind, with here and there some small crepitation, while all below each scapula was dull to percussion: moreover, auscultation found, coincident with the systole of the heart, and pervading the præcordial region, and conveyed along the aorta and carotids a distinct endocardial murmur.

A fortnight ago, after exposure to cold, she had been seized with a severe rigor, followed by heat and dyspnœa, and pain in the side; whereupon she had applied to a dispensary, and was largely bled, and leeched, and blistered: thus some immediate relief was obtained. But the disease, which was only checked, afterwards proceeded; and now, after the lapse of a fortnight, it was beyond the reach of a remedy. The poor girl was evidently sinking, and had only come into the hospital to die,—to die of the double pneumonia, as was thought, and nothing else; and surely it was quite enough to kill her.

But what meant the endocardial murmur found every where in the præcordial region, and conveyed through the arteries? It was too prominent a symptom to escape our notice, and it became our aim to make out what it really meant. Now these facts were pretty clearly ascertained,—that two years ago the patient had had acute rheumatism, and that ever afterwards she had suffered palpitation and frequent uneasiness in the seat of the heart. Here the rheumatism two years ago, the abiding palpitation from that time forth, and the present endocardial murmur, were facts which fitted into one another as compactly as one could wish, and seemed to furnish a complete proof of permanent valvular injury left behind by by-gone inflammation of the endocardium.

It is true that the heart was *now* beating with some excess of impulse; but so it had been (we learnt) for the last two years. It is also true that pain was referred to the left side, somewhere about the region of the heart, and that to breathe deeply increased it, and to lie on the left side increased it, and also brought on a sense of suffocation: but then the certain pneumonia and the almost certain pleurisy, were enough to account for all this.

Accordingly, we bent all our care to relieve the distress of one dying of pleuro-pneumony, thinking the heart not otherwise affected than by its old valvular injury. In four days the patient was dead. On examination, we found just what we expected in the lungs and pleura, but found nothing that we did, and every thing that we did not, expect in the heart.

On the left side the pleura exhibited everywhere the effects of acute inflammation. One-half of it was adherent, having, by lymph from its opposite surfaces, brought the entire lower lobe of the lung and the external pericardium in close union with the walls of the chest. The other half had fluid effused between its folds, which compassed and compressed the upper lobe. Of the lung itself on this side, one half, the lower, was infiltrated with pus, and contained a small circumscribed abscess; the other half, the upper, seemed by being compressed to have escaped being inflamed. On the right there were no marks of pleurisy, no adhesion, no lymph, no fluid. The lower lobes of the lung presented a state of earlier inflammation, and the upper lobe a state of emphysema.

But what of the heart? In attempting to lay open the pericardium, we found the heart surrounded with bags of pus, which we could not help cutting into one after another. They were partitioned by close and firm intervening adhesions. The pus and fluid contents of these several bags could not have amounted altogether to less than half a pint. Within the heart, the tricuspid, the mitral, and the aortic valves presented deposits of lymph on their free edges, which admitted of being rubbed off, leaving a rough surface in their place. The orifices of the heart were not at all contracted, and the cavities were of their due capacity, except that the right auricle seemed somewhat dilated. The liver was congested with blood and bile. (W. 21, 21.)

Here, then, were displayed within the heart the traces of two inflammations which occurred at an interval of years. The firm close partial adhesions of the pericardium constituted the abiding unsoundness produced and left by the rheumatic inflammation two years before, and the deposits of pus which intervened between them, and the deposits of lymph upon the several valves, were produced and left by acute inflammation of the pericardium and endocardium, coincident with the recent attack of pleuro-pneumony.

LECTURE XX.

SECONDARY INFLAMMATIONS CONTINUED.—CERTAINTY OF OUR KNOWLEDGE OF SEVERER AND FATAL CASES.—REASONABLE CONJECTURE OF MANY LESS SEVERE AND MORE MANAGEABLE. —INFERENCE FROM SUCCESSFUL TREATMENT.—DOES INFLAMMATION, AS OFTEN AS IT IS RENEWED, ADD SOMETHING TO THE PERMANENT INJURY OF THE HEART?—REASONS FROM ANALOGY WHY IT SOMETIMES DOES NOT.—REASONS FROM OBSERVATION WHY IT OFTEN DOES.—CASE OF INFLAMMATION MANY TIMES RENEWED IN THE COURSE OF YEARS AND ULTIMATELY FATAL.—COMMENTARY UPON IT AT LARGE.

The cases which have been related may be looked upon as giving the stamp or type of secondary inflammation of the heart. By secondary, you will recollect, is here meant inflammation occurring afresh in the endocardium, or in the pericardium, or in both, of a heart left unsound after prior inflammation, which had affected one or other or both of the same structures.

Take, then, this stamp or type of the disease and examine it carefully, and you will find that in part it leaves a clear and legible impression, and in part a faint outline only. The secondary inflammation of the heart has its clinical history well made out, not so its clinical diagnosis. The conditions conducing to it and giving expectation that it will occur, are plain enough. The signs denoting its actual presence are equivocal and uncertain.

For the sake of illustrating this secondary inflammation of the heart, we have hitherto been dealing with its severest and its fatal instances only. For we were in search of its sure diagnostic signs; and its severest instances were most likely to display them, if any such there were. But, finding no sure diagnostic signs even in these, we wanted the proof which fatal ıstances would alone afford us, that the disease, so obscurely eclaring itself during life, had a real existence. This doubt uld only be set at rest by dissection after death.

The reality of the disease, and its fatal tendency, and its scure diagnosis, being all admitted, it became the more ecessary to acquaint ourselves with its coincidents and accomaniments, if perhaps by marking them, and being through em on the watch for it, and knowing when to expect it, we ight catch a glimpse of it in its hiding place, and so treat it, ıd arrest it, and cure it.

These coincidents or accompaniments are an attack of acute eumatism, or an attack of pneumonia or pleurisy, or an tack of fever from any cause whatever. And when any one these befals a man whose heart has been left unsound by a rior inflammation, then inflammation is apt to be renewed in afresh. And when, under such circumstances and in such a ıbject, the heart, which habitually palpitates and is habitually neasy, suffers a great increase of palpitation and of pain, then s inflammation should be assumed as a fact.

It is among the general truths of pathology that parts left nsound by past disease have a greater readiness to catch isease afresh, from causes calculated to convey it, than parts hich never were injured before. As a taper just blown out, ill snatch the flame from the torch that scarcely touches it, nd so rekindle itself at once. Thus independent of our special xperience, the known pathological principle would teach us pon any extraordinary vascular excitement, whether inflamıatory or febrile, to fear for the heart once inflamed and still nsound, and to watch any new symptoms belonging to it, and lways to make much of them, and even to interpret them to ıean inflammation, though, under ordinary circumstances, hey might safely be not so regarded.

After all, then, you will observe, that, for the actual preence of this secondary inflammation in any case, and for our uidance in treating it, we have only the warrant of conjecture. t is most true.

But there is such a thing as sober conjecture, as well as ober certainty. And diseases are treated, and cures are chieved, and lives are saved, as often under the guidance of ne as the other. Such conjecture, however, is altogether different from the arrogant guess-work, which has no basis of action, and which succeeds once and fails twenty times, and knows as little why it succeeds as why it fails.

The conjecture which should guide the physician, is rigorous, and calculating, and honest. It acts strictly by rule and leaves nothing to chance. It does not absolutely see the thing it is in quest of, for then it would no longer be conjecture. But, because it does not see it, it ponders all its accidents and appurtenances, and, noting well whither they point, it takes aim in the same direction, and so oftener hits the mark than misses it. And succeeding thus, it knows why it succeeds, and it can succeed again and again upon the same terms.

Next to knowing the truth itself, is to know the direction in which it lies. And this is the peculiar praise of a sound conjecture.

Now, remember, the cases of secondary inflammation of the heart hitherto considered have been all fatal cases, all severe, all great cases, as you might call them. But there is often a relationship in medicine between the great things and the small. And we have learnt a good practical lesson when we have found out what the relationship is. It is often such as to require that the greater should be understood first, and preparatorily. For the nature of both being the same cannot be well apprehended in its miniature forms, unless it be first studied in its larger and more striking developments. Nay, more, the smaller things being understood, require still to be handled and dealt with in continual reference to the knowledge we have of the greater.

No physician trifles with inflammations of the larynx or trachea. Some of them are of small account, just tickling the glottis, and untuning the voice; and some of them bring great oppression, from the infinite quantity of mucus perpetually expectorated and perpetually renewed, yet for the most part they are manageable enough: and some of them harass and torment with a scanty tenacious phlegm, which stings intolerably the parts it rests upon, and so there is no end of coughing night and day, yet they, too, for the most part yield to the power of medicine at last, and are cured.

But there *is* an inflammation of the larynx and trachea, which, what with the obstruction and the spasm together that are induced by it, shuts out air from the lungs, and strangles a man to death.

Now this last inflammation must be known in all its bearings, or our knowledge of all the rest will be imperfect; for, being of the same, or at least of a kindred nature, with it, they all contain within them the possibility of growing up to the same magnitude, and placing life in the same jeopardy. Therefore, in dealing with the least of them, with the mere tickling vexing cough, we are to take it for what it is, and treat it for what it is, but not to forget what it may be. And so of all the rest.

Now, if living phenomena alone, carefully noted and compared, can be trusted without the aid of morbid anatomy for fixing by a fair conjecture the reality of a disease, then secondary inflammation of the heart has many less severe, many less intractable forms. Cases are by no means of unfrequent occurrence, running parallel with those which have been related, both in what constitutes their clinical history and their clinical diagnosis, while they are more amenable to medical treatment. Their preceding and accompanying conditions are still the same, and equally clear and definite, namely, a rheumatism, a pulmonary inflammation, or a fever; and their signs immediately referable to the heart are still the same, and equally equivocal and ambiguous, namely, augmented impulse and augmented pain.

These are the common conditions which seem to declare the individual cases tied together into one species. But what is it that declares their differences of degree, the more or the less severe case, the great or the small, the case which is far beyond, or is fairly within, the reach of medicine? Nothing, as far as I know, but the actual trial of medicine itself will manifest all this. I believe, that whenever the heart is re-inflamed by a fresh attack of rheumatism, there is almost always a tremendous accession of palpitation and pain. Oftentimes, however, when the palpitation and the pain have been the greatest, they have been most easily subdued. So these are no sure measure of the severity of the disease, and no sure warning of its fatal result.

I could relate numerous cases of one and the same species (as I believe) with those which have been already given, yet in perfect contrast with them as to this single respect, namely, their readiness to admit the remedial impression of medicine. Contrasted with the few cases (for they *are* the few) where, on a fresh attack of rheumatism, vehement palpitation and præcordial anguish arise, and remedies have no effect in abating them, and complications of pleurisy or of pneumonia follow, and the whole man is rapidly subdued, and the end is death: contrasted with these are the many (for happily they *are* the many), where, under the like conditions, palpitation and præcordial anguish just as great arise, but they are readily controlled and abated by remedies, and no complications of pleurisy or pneumonia follow; and the constitution does not profoundly suffer, and the end is recovery. By recovery I here mean, that the attack ceases, and leaves the patient in no worse a condition, as far as symptoms referable to the heart are concerned, than that in which it found him.

To escape with life from a renewed attack of endocarditis or pericarditis, and not only to escape with life, but without aggravation of the symptoms which permanently belong to the heart, are possible and frequent events; but they can only be ensured by discreet medical management. In such cases it is important neither to do too little nor too much. It is true there is a tremendous augmentation of distress immediately upon the accession of this secondary inflammation, but the inflammation is easily made to lose its hold (if I may so say), and the distress is soon abated.

As to the kind of medical treatment, I would remark generally, first, with respect to bleeding, that if you now direct this mode of depletion with the view of *entirely* stilling the violent action of the heart and arteries, you propose a false and impossible indication of practice; false, because this violent action is in part permanent, and has not to do with the present conditions of disease; impossible, because no quantity of bleeding short of that which would kill the patient would be adequate to the purpose; and, secondly, with respect to mercury, that all which can now be done is commonly within the reach of other remedies, and therefore that *commonly* it is unnecessary.

Leeches applied to the region of the heart will, by the immediate effect which they produce, test the sort of inflammation you have to deal with, and show whether any and what other remedy will be needed in counteraction of it. If they at once afford marked relief, they thus denote both that the inflammation is easily controllable, and that they, without the aid ot any other remedy properly antiphlogistic, will be able to control it. And so it will turn out in the majority of cases. But if they afford no marked relief at once, or, still more, after their repeated application, then they plainly proclaim the inflammation beyond their power to cope with, and they call for the help of mercury (as at first) to withhold it from a fatal issue: but this does not often happen.

In the treatment of these secondary inflammations, it must always be borne in mind that they *are* secondary. We must restrict our practice to the purpose of removing so much of the disease as is superadded by the present attack, and abstain from pushing either bleeding or mercury to such an extent as we should if we proposed to play a successful after-game for the complete cure of the disease of the heart, which is impossible.

But these secondary attacks of inflammation which people suffer and recover from, and suffer and recover from again and again, do they always add something to the permanent unsoundness of the heart? I cannot tell; but probably not always.

What is that which has really the nature of inflammation, yet of inflammation in its least degree? And what is the least material injury which inflammation is capable of doing? The following, perhaps, may be regarded as a specimen of both. I have often had occasion to examine the eye of an individual who suffered purulent ophthalmia many years ago. Part of the cornea is converted into a dense opaque substance, the cicatrix of its former injury, and part remains transparent. Often, from inclement weather, or from any cause operating injuriously on the general health, a painful sense of fulness is felt in the eye, and presently its small sphere of vision becomes cloudy; and, if it be now examined, these two changes are found to take place, one after the other, within it. First, the cicatrix is seen to be full of minute blood-vessels, while the rest of the cornea exhibits no extraordinary vascularity, unless, perhaps, there be a single vessel running across it, and carrying its blood straight into the cicatrix. Secondly, a little nebulous curtain is seen all along the margin of the cicatrix, as if it were falling down from it upon the transparent portion of the cornea. In a couple of days, without any special remedy, merely by care to avoid external cold and by abstinence from stimulating diet, the eye loses its painful sensations, and its small sphere of vision becomes again clear; and, being then examined, both the vascularity of the cicatrix and the nebulous curtain that hung from its border have disappeared.

Exactly the same malady will occur many times in the course of the year, and exactly the same processes of disease and reparation will display themselves many times in the eye and leave it just as it was before. Here, surely, are both inflammation and *material* injury, the effect of inflammation. Yet how small are they; small both in degree and in extent! How easily produced, and how easily and entirely cured! But, observe, the inflammation is of a new structure, entering into the composition of the unsound part, and it comes and it goes, and does its little temporary injury, and, after all, adds nothing to the permanent unsoundness.

Now, may we take this slight secondary inflammation of an unsound structure, and this slight material injury done by it, of which we *can* see the growth and progress, the decline and reparation in the eye; may we take them as types representing certain secondary inflammations and their effects within the body, which we *cannot* see, but which, nevertheless, we treat as inflammation, and readily seem to cure? In short, may we take them to represent what the unsound heart often suffers and recovers from, when, upon fresh attacks of acute rheumatism, it is affected in the manner described, and, being treated as if it were inflamed, is relieved from its present excess of palpitation and pain?

Unquestionably, this is a very important class of affections of the heart which we have been considering, and needing, from the very default of precise diagnostic signs, that all their other circumstances should be the more carefully examined. It is most true that neither our eyes nor ears can testify what it is we treat, or what it is we cure, but we treat and we cure something. The clinical history of the patient, his previous condition and his past diseases and all the incidents and appurtenances of his present attack, and especially the nature of the remedies which procure his relief, are enough to show, even in default of precise diagnostic signs, that we treat and cure a secondary inflammation of the heart.

But secondary inflammation of the heart often shows itself in such a manner as to constitute a class of cases intermediate between those which were noticed in the former lecture and those which have been just described, more amenable to the treatment than the first, and less so than the last. Like the primary inflammation, it will often continue for some time after the rheumatism, or whatever be the coincident malady which seems to have reproduced it, has passed away, and still require a special treatment to withhold it from a fatal termination, and then, as in the primary inflammation, so in this after it is fairly arrested, many weeks will sometimes elapse before the patient is brought back to a state of present safety; and then at last it will be quite evident that something has been added to the permanent unsoundness of the heart. The habitual palpitation and præcordial uneasiness will now be found greater than they were before, and having a greater amount of dyspnœa as their constant accompaniment; and they will all, palpitation, and pain, and dyspnœa, now show themselves capable of being aggravated upon slighter and more frequent occasions, and so will place every action and movement of the body under a more severe and painful restraint.

When secondary inflammation has been thus a few times renewed in the heart, and the patient, though his life be saved, has reverted after each attack to a worse condition than before, it is remarkable how little it takes to light it up afresh. A rheumatic fever is sure to do it; even a common febrile catarrh may do it; nay, it will sometimes appear to light itself up spontaneously; and thus with a cause or without a cause it will return, or seem to return, at short intervals of months or weeks, and the patient perhaps will at last die of an attack much less severe than many a one that has preceded it.

The inflammation (I say) will return, or *seem* to return; for now, when the palpitation and the anguish of the heart and the dyspnœa are constantly severe, we must not be too peremptory in believing that every exasperation of them to a higher degree of severity is caused by a fresh access of inflammation. Sometimes mere rest will abate them, and sometimes rest with the help of an opiate; and all this looks very unlike inflammation, but is far from conclusive that it is *not* inflammation. Sometimes both rest and an opiate together will fail without the aid of leeches, and even of leeches more than once applied; and all this looks very like inflammation, but is far from conclusive that it *is* inflammation.

Here, perhaps, I ought to go into the details of a score or two of cases for confirmation of what I have been saying; but unfortunately they would need to be long details, and I dare not venture upon them. The circumstances of half a man's life may and have a bearing upon his present disease (they indeed often have upon the secondary inflammation of the heart) and, when you come to set them forth, you seem rather to be telling a story than relating a case.

One such story, however, I must tell, as a specimen. It will be found to contain a good deal to the purpose, and may stand in the place of many. There was a certain youth, David Aikin by name, and he was fifteen years of age; he was a poor puny lad, and first came under my care at St. Bartholomew's Hospital, when he was suffering an attack of acute rheumatism. The proper rheumatic symptoms were trifling, but there was great pain in the præcordial region. The heart beats with an excessive impulse, which was perceptible over a much larger space than natural, and each contraction of the ventricles was accompanied by a loud endocardial murmur.

The boy's father said that he had never been well since his childhood. It was then that he was first ill of rheumatic fever, which affected his chest, and thenceforward he had always suffered palpitation, and shortness of breath. The palpitation, however, and dyspnœa, were now much worse than usual; and this was the case upon every fresh attack of rheumatism which he had suffered; and he had suffered a great number.

On this occasion the proper rheumatic symptoms were soon removed, but the præcordial pain, and the excessive impulse of the heart were not abated, until, besides the application of leeches, a few ounces of blood were taken from the arm; and after all the impulse still remained far greater than natural, and the murmur as loud as ever; conditions which it was in vain to think of getting rid of altogether. And so in a few weeks he left the hospital, with the same palpitation, and the same asthma, as he called it, which he had had for years.

Some weeks after he was re-admitted into the hospital, suffering great distress of respiration; yet there was a clear respiratory murmur, unmixed with crepitation, throughout every part of the lungs. But the heart was beating most tumultuously, and with a loud endocardial murmur. There was now no rheumatism, and no accompanying fever. Mere quiet restored him to a state of tolerable comfort, and he again left the hospital without any change in the essential conditions of his complaint.

Some months afterwards, happening to visit the Middlesex Hospital, I was taken by Dr. Watson to see a case of diseased heart, which he was watching with some interest, and I immediately recognised poor Aikin as the subject of it. He had experienced another attack of rheumatism, which, as usual, had greatly augmented all that the heart habitually suffered. The rheumatism had now passed away, yet fever still remained, and with it a severe præcordial pain. But the heart had almost lost its endocardial murmur, and its impulse could hardly be felt. It fluttered and faltered, and its contractions were all too weak to make its murmur clearly audible. He lingered a few days longer, and then died, as if from exhaustion.

I was permitted to be present at the examination of the body, and these were the most important appearances which presented themselves. The cavity of the pericardium was entirely obliterated by the most close and intimate adhesion: the pericardium seemed one with the heart, no visible trace of lymph any where remaining as the medium of their union, except opposite the right auricle. And here, too, there was at first an appearance of the same intimate adhesion of the opposite pericardial surfaces, with great augmentation of the muscular substance, but, upon a section of the auricle, what had seemed its proper muscular substance, was in fact found to be coagulable lymph of the firmest, densest texture, half an inch thick, and so deeply injected with blood as to have the appearance of muscle. Beginning from this situation we were able, not without much force, to separate the adherent pericardium, and to detach it entirely from the heart. It was much thickened at every part, yet not, except opposite the right auricle, by lymph heaped upon its surface, but by interstitial deposition within its own texture. Its adherent surface, now detached, was tolerably smooth, and of a deep red colour.

The muscular substance of the heart was unequally

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thickened, and one of its cavities only was dilated. On the right side neither its muscular substance was thicker than natural, nor its cavities of larger capacity. On the left the auricle was neither thicker nor more capacious than natural, but the ventricle was both by at least one-third. In every part of the heart, both where it was thickened and where it was not, the muscular substance was of the hardest and toughest texture, and its colour of the deepest red.

The internal lining of the heart was universally of the same deep red colour, and so was the lining of the aorta. The mitral valve and the semilunar valve of the aorta, were a little thickened and puckered.

A small quantity of bloody serum was found in both cavities of the pleura, and on both sides there was a partial and slight adhesion of the lungs to the ribs. The lungs were full of bloody serum. In parts they cut as if they were solid; but still they were every where pervious to air, for every part floated in water.

Now there is such a thing as reading disease backwards, if I may so say. And a very profitable method it sometimes is. For reading it in the ordinary way we may not have made out the matter to our perfect satisfaction, and may have great need of this retrospect to elucidate it. What I mean by reading a disease backwards is, having its results before us and trying to unravel their series and sequences, and so to interpret the time of their occurrence and to assign them a relation to past events of its clinical history; to learn what took place last or yesterday, and had a share in the process of dissolution, and what took place earlier and had to do with antecedent attacks, and what took place earlier still, and was the rudimental change which accompanied the first transition from health to disease. In this way disease is traced back from its end to its beginning by the prints or vestiges it leaves of itself during its progress.

The changes of structure, appertaining to the heart in the case just related, were very numerous and complex, but their meaning was construable enough. They were all reducible to three distinct forms, those which arose last of all and at the very end of the disease, and those which took place at mid-periods, and those which came first of all and at its beginning.

First, there was the deep red tinge at every part of the organ, the entire saturation with injected blood of all that remained to it which could be called healthy, and of all that was added to it by disease. And this unquestionably denoted the closing effort, the last work of disease within the blood-vessels, bearing simultaneously with fatal force, both upon the lungs and upon the heart; and this was the immediate cause of death.

Secondly, there was the great mass of hard tough lymph encasing the right auricle, and the interstitial thickening of the pericardium, and the remarkable induration of the entire muscular substance of the heart. And these were probably the results of the several renewed attacks of inflammation, each augmenting the heart's unsoundness, by adding something of the same morbid species to what there was before, depositing fibrine upon fibrine, and interlacing it more and more with the membranous and muscular textures, and so spoiling them.

And, thirdly, there were the close union of the pericardium with the heart at every part, except opposite the right auricle, and the thickened and puckered mitral and aortic valves. And these were probably the results of the earliest attack of pericarditis and endocarditis. The inflammation ceased and never afterwards returned to the endocardium. The beads of lymph were absorbed or thrown off from the valves, and where they had been the surfaces were left uneven. But this amount of injury which was done by the first inflammation was never afterwards augmented in the least degree. And the inflammation ceased too, and probably never afterwards returned to the pericardium at the same part or after the same manner. The serum and lymph were absorbed, and there followed a close adhesion of its opposite surfaces, which nothing afterwards disturbed.

All these several changes of structure found in a single heart, which we have been commenting upon, were none other than the immediate effects of the first and of each subsequently renewed inflammation, or rather the very work of the inflammatory processes themselves.

But there was yet something more in the same heart, something noticeable enough but not to be particularly dwelt upon in this place, the augmented capacity and augmented bulk of the left ventricle. These were not the work of any inflammatory process. They were no disease in themselves, but the remote mechanical results of disease. Of such we shall speak hereafter.

LECTURE XXI.

THE UNREPAIRED EFFECTS OF ENDOCARDITIS AND PERICARDITIS BOTH CONSTITUTE A PERMANENT UNSOUNDNESS OF THE HEART IN THEMSELVES, AND BECOME THE POSSIBLE ELEMENTS OF FURTHER UNSOUNDNESS BEYOND THEMSELVES.—THE SAME MAY BE SAID OF THE UNREPAIRED EFFECTS OF OTHER DISEASES.—THIS FURTHER UNSOUNDNESS A THING DIFFERENT IN KIND.—NATURAL DISTINCTION BETWEEN THE UNSOUNDNESS FROM DISEASE, AND THE UNSOUNDNESS FROM DISORGANISATION.—SUMMARY ACCOUNT OF THE UNSOUNDNESS FROM ENDOCARDITIS; COMPARED (BY ANTICIPATION) WITH THE UNSOUNDNESS FROM OTHER DISEASES OF THE ENDOCARDIUM.

It has been already said, that when the heart is left in a state of unsoundness by past inflammation, whether of the endocardium, or of the pericardium, or of both, two principal consequences are to be expected. Either there may be a renewal of inflammation in the unrepaired structure, or in some other structure, of the same heart; or the unrepaired structure, remaining as it was left, may become the element of further material changes in the whole organ. The first of these consequences has been considered already. The second remains to be considered.

Now this last is much the more frequent of the two. The first, *i.e.* the renewal of inflammation in the unsound heart, happens comparatively to few. For it is, as we have remarked, of the nature of an accident, and dependent on circumstances befalling the individual. But the further disorganisation of the heart, growing out of the elementary unsoundness left by inflammation, certainly happens to the vast majority, and, if accurate measure could be taken during life, of all its degrees, would probably be found to happen almost to all. For it springs, as we have remarked, from a natural and inevitable tendency. Wherever there is unsoundness of any elementary tissue from disease, further unsoundness is (I believe) almost sure to follow sooner or late from *disorganisation*. Different as they are in their nature, there is a link of connexion between them. The first is a chief originating cause of the second. Therefore, in passing from one to the other, we do not violate but rather preserve the context of our subject.

I know not whether these terms, unsoundness from disease and unsoundness from disorganisation, be the best that could be chosen to express my meaning, but, as I shall often hereafter make use of the same, it would be well for me to state briefly what I wish to be understood by them.

Already, a good deal has been intimated respecting the unsoundness from disease, but nothing yet respecting the unsoundness from disorganisation. In distinguishing between them, we must try first to get a right notion of what each is in its own nature, and then to make good the link which connects them.

Now they may be characterised generally after the following manner. In both there is a material detriment done to the natural structure of the heart. When the unsoundness is from disease, the detriment is of the same kind which the same disease, be it what it may, whether inflammation or struma or cancer, would produce in every other part of the body. But where the unsoundness is from disorganisation, the detriment is of a kind proper to the heart itself, and such as never does, and never can, take place in any other organ of the body.

Again the unsoundness from disease is made up of new substances which each disease produces according to its kind, and which are different from the natural and healthy substance, and are superadded to it or are substituted for it: or it results from a simple destruction of the natural and healthy substance. But the unsoundness from disorganisation consists in alterations of bulk and size and shape and capacity, no other causes being engaged in bringing them about than those which are constantly at work within the healthy heart, viz. its own vital movements; only they are now at work with more or with less energy than is either natural or healthy, or they are at work without their natural and healthy harmony.

But what is it that can rouse the vital movements of the heart to a greater energy than natural, or subdue them to a less, or can disturb their natural harmony? It must be something within or without the heart amounting to a physical necessity. When it is within the heart, the previous injury of some of its elementary tissues from disease is that necessity. And hence is formed the link of connexion between the unsoundness of disease and the unsoundness of disorganisation. When it is without the heart, the ailments or injuries of other organs originate the necessity, and then convey it through the vascular system or the nervous system, and so make it felt in and by the heart. Let this serve for a brief sketch of what is meant pathologically by the heart's unsoundness from disease, and the heart's unsoundness from disorganisation, and the essential differences which separate them.

But our business is first with the unsoundness of *inflammation*. For we are pursuing endocarditis and pericarditis to their consequences. Nevertheless, we must follow the subject as it naturally expands itself, and be careful of handling it too exclusively. Inflammation, as to the manner in which it furnishes the element of disorganisation, illustrates the operation of every other disease which is also capable of furnishing it; and every other disease illustrates the operation of inflammation in the like respect. And for this very reason they must be considered together.

Well then, has all been said that need be said of this structural unsoundness of the heart in both its kinds *pathologically*, and may we now proceed at once to clinical history, and clinical diagnosis and treatment; to what these things are and whence they come and how they show themselves and what they need and what they will bear in the *living man?* Let us pause awhile and consider; for if any further explanations of a general sort be needed preparatory to a just comprehension of what is to come, this is the place for them. And I believe they *are* needed. Such explanations now given will save us much time and many words and many a troublesome digression. For this structural unsoundness of the heart in both its kinds brings us to that class of its affections, before announced,* which are "secret and chronic in their growth and unalterable and irremediable in their nature." And I have already promised to beware of treating them too much at large.

* Page 54.

But it is the knowledge of their *living* forms that we especially desire to be conversant with. And this knowledge is not a whit the less pathological, because it is pre-eminently practical. Yet I cannot manage to display it as clearly as I could wish without first entering into details which are pathological in the stricter and more technical sense; without first asking of morbid anatomy what it has to tell of the effects of inflammation within the heart when they have become permanent from a failure of perfect reparation, and of its effects both permanent and cumulative from several accessions of inflammation and from several failures of perfect reparation; and also of the effects of other disease within the heart, which is not inflammatory; and further what it has to tell of alterations of size and bulk and shape and capacity in the heart. The former will include all that *materially* belongs to unsoundness of the heart from disease in its several degrees from the least to the greatest; the latter all that *materially* belongs to its unsoundness from disorganisation in its several forms from the simplest to the most complex.

Still I am not going to give an inventory of a whole museum, but only to choose the fittest specimens to represent the kind of things with which we have to do, and the fittest to mark their reality, a reality, which now, when we are approaching those parts of our subject which we must be content to generalise, will often need to be borne in mind, that it may keep us to tangible points and withhold us from running oft into mere speculation.

It has appeared that out of sixty-three cases of endocarditis, reparation was perfect in seventeen: for in them the murmur ceased entirely. And that reparation was imperfect in forty-six, for in them the murmur continued while life was safe for the present.* But it is not from these forty-six cases that I must draw my information of the nature and effects of an unsound endocardium, but from those which I have casually met with in the course of years.

By the description already given of the damage which endocarditis is capable of doing, it has been seen how great it is in some cases and how small it is in others, and consequently how much is left for reparation to effect in some and how little in others, whether the result be the restoration of the membrane to perfect soundness, or only the diminution of its unsoundness to a degree compatible with life. Our present business is with the latter result.

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* Page 88.

In looking over such records as I possess, of dissections made where death had taken place at various periods of many months or of many years after the attack which did the original detriment to the endocardium, I find that the morbid appearances may be reduced to a few, to opacity and thickening of the membrane, to marks of perfect and imperfect cicatrisation, and to breach of surface or solution of continuity.

The opacity and thickening vary much in their extent. Sometimes they are confined to a single valve or to part of one only, to its free edge; sometimes they affect more than one, generally two, the mitral and the aortic valves; and they occasionally extend to the valves of both sides of the heart, and pervade both their proper membranous expansions and the tendinous cords proceeding from them. Further, this same opacity and thickening belong sometimes to other portions of the endocardium beside those which form the valves and their appurtenances, especially to the lining of the left ventricle nearest the aorta and to the whole lining of the left auricle.

Beside such general opacity and thickening a particular valve sometimes presents a hard elevated line or ridge where it is especially thickened, or a small spot where it is indented or depressed, looking like a complete cicatrisation in one case and an incomplete cicatrisation in the other.

Sometimes a valve is perforated or cribriform or it wants a portion at its edge, or a tendinous cord is snapt in two and its ends are hanging loose within the cavity of the ventricle.

If this be a true sketch of the heart's permanent unsoundness derived from the imperfectly repaired effects of endocardial inflammation, and this its different extent, and these its several forms, and these its situations in different cases, you will see that the blood must thenceforward always encounter some impediment in its passage through the heart. And you will see too how various must be the amount of that impediment, how in one case it must be great and in another next to nothing, and you will be prepared for the various fate of those who owe the first damage of their heart to a rheumatic endocarditis.

All this is obvious enough. But belonging to the same district of pathology there are certain conditions which are less obvious and which, as far as I know, have never been noticed at all, but which I desire particularly to insist upon, on account of their great practical importance. Indeed they need to be pointed out as lights and signals to steer by, when we come to contemplate, in the living man, the effects both immediate and remote of the heart's unsoundness derived from endocardial inflammation, and when we are required to treat them and to give opinions about them.

This then I believe to be a fact which, if not true in every instance without exception, is true in the majority, viz. that, after inflammation of the endocardium has ceased, and reparation has done its best, and all that is reparable is repaired, whatever remnant of unsoundness be left, it continues ever afterwards without increase *in its own kind.* After the lapse of years the very appearance of all we find seems to testify that it has long been stationary. There is no vestige of changes recently in progress, no new growths mixed with old growths; each cicatrix is an old cicatrix, each perforation an old perforation; all looks as if it bore the same date, and had been brought to pass simultaneously. And hereafter, when the results of clinical observation are compared with those of morbid anatomy, they will be found to testify the same thing.

The unsoundness left after endocardial inflammation remains (I say) without increase in its own *kind.* What is thickened does not go on to be thickened more and more. What is cicatrised does not go on granulating. Perforations and breach of surface do not become larger and larger. All this I suspect could only come from a renewal of inflammation in the endocardium. But inflammation naturally comes to an end, and when it has once ceased, there is not, I suspect, any natural principle of growth in the things which it leaves behind enabling them to increase of themselves. And herein inflammation and its effects will be found contrasted with other diseases of the endocardium and their effects, such I mean as produce deposits of cartilage, atheroma, and bone. Here either the diseases do not naturally come to an end, or their effects have a natural power of growth within themselves. For cartilage, atheroma, and bone go on increasing indefinitely. No doubt great structural damage is sometimes involved in the unsoundness which remains after a single attack of endocarditis. But upon the whole it is not apt to be carried to an extreme degree. When an orifice of the heart has undergone extreme stricture, when the mitral orifice for instance has been so narrowed as not to admit the passage of a finger, I have commonly found that the clinical history of the case has not assigned its beginning to any certain period or to any known attack of inflammation; but it has testified on the contrary that the symptoms referable to the heart arose and increased covertly and gradually, until they reached an intolerable amount. The utter detriment and spoiling of the valve appertaining to the orifice, and causing its extreme stricture, is not the stationary remnant of unsoundness left by an attack or two of accidental inflammation, but the progressive growth of unsoundness built up by a never-ending chronic disease.

Further, it has already been stated, as a very general fact, that the louder the endocardial murmur the less is the amount of valvular impediment. Now, in almost all cases where the heart's unsoundness is traceable back to an attack of rheumatic endocarditis, the murmur is apt to be peculiarly loud. In such cases then the inference would be, that the valvular impediment is not great. It is remarkable moreover that the instances which have furnished me the proof of this fact—of the louder the murmur the less the impediment—have been chiefly where the heart-affection has originated in acute rheumatism.

But be it remembered, that a further mischief to the heart is always expected to follow the imperfectly repaired injury or remnant of unsoundness left by endocarditis. But it is a mischief different in kind, another sort of injury altogether; it is the unsoundness of disorganisation grafted upon the unsoundness of disease. This will be considered in its turn.

LECTURE XXII.

CONSEQUENCES TO LIFE AND HEALTH FROM THE PERMANENT UNSOUNDNESS OF THE HEART REMAINING AFTER ENDOCARDITIS.—1. CASES IN WHICH BESIDE THE PERMANENT ENDOCARDIAL MURMUR THERE IS NO OTHER SYMPTOM REFERABLE TO THE HEART; 2. CASES IN WHICH BESIDE THE MURMUR THERE IS OCCASIONAL PALPITATION; 3. CASES IN WHICH BESIDE THE MURMUR THERE IS CONSTANT PALPITATION.

HAVING considered that form of permanent unsoundness of the heart, which consists in the unrepaired effects of endocarditis, we are prepared to pass from the nature of the thing itself to its living consequences.

The endocardial murmur having become permanent, and denoting (as it undoubtedly does) permanent injury of some portion of the endocardium, it becomes most interesting to enquire what follows; what detriment either immediately or in process of time results to the health and well-being of the patients. In some no detriment whatever immediately results. Together with the permanent endocardial murmur they suffer neither pain nor palpitation nor any sort of distress or embarrassment referable to the heart under any circumstances. Their disease is no affair of their own consciousness. The physician hears something but they feel nothing; they believe themselves well, but the physician knows that they have an injured portion of the endocardium.

Now the severest and the mildest cases of endocarditis have equally this termination. The fever, pain, and swelling of the joints, may have been excessive, and anguish and distress of the chest and palpitation and fluttering of the heart may have kept life in jeopardy for many days. But these may all pass away, and nothing remain except the endocardial murmur.

Or the fever, pain, and swelling of the joints may have been barely enough to characterise the disease, and there may have been no symptom, either pain or anguish or palpitation or fluttering, which could denote that the heart had any share in it, save only the endocardial murmur. But this never ceases.

Here then is a certain injury of the endocardium, which the heart bears patiently and unconsciously, neither feeling it nor resenting it for the present. But what in process of time is the event of such cases?

You may think perhaps that my experience should be ample enough to tell you all that can be known concerning them. But indeed it does not reach so far in this matter as you might at first suppose. It is true that I have witnessed the original disease in a great multitude of individuals, and I have seen its symptoms dwindle down to the single one in question. But the vast majority of those discharged from the hospital still bearing this symptom have escaped entirely beyond my observation, and I have never seen or heard of them more.

Some however have again fallen in my way, and thus I have been able to pick up certain particulars of information which it may be useful for you to know.

It has not unfrequently happened to me, when I have been examining patients at the hospital, to find the marks of former leech bites or the scarifications of cupping glasses upon the præcordial region; and this circumstance, and not any complaint of their own in this quarter, has led me to apply my ear to it, and thereupon I have discovered the endocardial murmur. Inquiring when and why it was they had need of leeches or cupping to this part, I have learnt from them that it was when they had a rheumatic fever, and because at that time something was the matter with their heart. But this happened years ago. They got well, and from that day to the present they have remained without palpitation, or shortness of breath, or any inconvenience whatever referable to the heart, which they were at all conscious of.

In these individuals there can be no doubt that the condition of the endocardium, which now gives occasion to the murmur, had its origin in inflammation coincident with the attack of rheumatism to which they refer. Indeed some of them I have recognised as having been my own patients, and turning to my record of their former malady I have found the fact to be just as they have stated it. They suffered acute rheumatism in the course of which the murmur arose. The rheumatism ceased but the murmur remained, and they finally left the hospital carrying with them the still audible murmur. Between the origin of the murmur dated from the attack of acute rheumatism and the present time when it is found still to continue, there has been in the several cases an interval of one, two, three, four and five years, and in the meanwhile the patients, most of whom have been engaged in occupations needing bodily exertion, have been unconscious of ailment.

The cases in question convey this piece of consolatory information, that while there is no doubt to what disastrous results the injury of the endocardium naturally tends, it does not go on at once and of necessity to produce them, but that, between the elementary morbid process and the results which are most expected and most feared, there may be a suspense of years. For even under the unfavourable conditions which belong to a life of hard bodily labour, such permanent organic changes of the endocardium as are left by acute inflammation and denoted by the murmur may exist for five years without the least consciousness on the part of the patient, that he has any disease of the heart.

But what is the actual condition of the heart in such cases? Whatever was the condition in which it was left after the original attack of acute rheumatism, the same (there is reason to believe) is its condition now. The physician then heard the murmur, and now after the lapse of years he hears the same, but discovers nothing more; and so he has no grounds for believing that further detriment has arisen to the organisation of the heart even after the lapse of years. He knows that there is an injured portion of the endocardium but he knows nothing more.

Now where the heart bears the injury of its endocardium thus patiently for years, it is fair to infer that that injury is either so small or so fortunately placed, as to offer no sensible obstruction to the passage of the blood. A little ridge on the surface of a valve, a little granule on its free edge, or a little thickening or shortening of a tendinous cord, may be conceived capable of occasioning eddies and vibrations of the blood which can be heard, without producing any hindrance of its current which can be felt.

Of all those who suffer rheumatic endocarditis and recover but with some permanent detriment done to a portion of the endocardium, a large proportion, I suspect, fall under the foregoing description.

This fact then is ascertained and confirmed by experience, viz. that the damage done to the endocardium by rheumatic inflammation may abide for four or five years without producing any conscious detriment to the health or well-being of the patient, or (as far as we have the means of judging) any farther injury to the structure of the heart. And it is a most important and consolatory fact. But in other instances other results immediately follow. When after its departure acute rheumatism leaves the endocardial murmur behind it, which, though known only to the physician, is the sure sign of injury done to the endocardium, it leaves it attended from the beginning by other symptoms, which the patient is sufficiently conscious of, and these are directly referable to the heart. They consist of palpitation, and some pain, and some dyspnœa, which are not constantly present, but only under bodily exertion and mental excitement. The child who has had the præcordial murmur ever since it suffered a certain rheumatic attack, is just the same child it was before, except that it cannot join in any pastime requiring rapid movement: for then its heart palpitates, it loses its breath and is obliged to sit down. Men too are just the same men they were before, only perhaps they cannot run upstairs without panting and hurry, and they constantly find themselves obliged to restrain their bodily efforts within certain limits, and to beware of mental excitement, for fear of palpitation and dyspnœa.

These conditions too may remain for years without either augmentation or abatement. The murmur is never absent, but the palpitation and dyspnœa are never present except as the immediate effect of a certain amount of bodily exertion or mental excitement.

Among the cases of rheumatic endocarditis whose history I have investigated, the instances have been very numerous in which I have found a space of from one to five years immediately succeeding the original attack exempt, according to the patient's own account, from all ailment except an occasional palpitation and dyspnœa. This exemption however has been favoured by peculiar circumstances, by a daily occupation not requiring bodily labour and free from the greater cares and hardships of life. The patients have been men of sedentary professions or they have been young people, the children of parents in easy circumstances. I have lately seen a young lady thirteen years of age, whom I attended three years and a half ago under an attack of acute rheumatism attended by endocarditis. The symptoms during the attack referable to the heart were completely characteristic of the disease, and carried to such extremity, as to keep life in peril for several days. It was perhaps the severest case I ever saw recover. She did recover, however, but never lost the murmur and occasional palpitation. At present she has the appearance of perfect health. She even bears the marks of premature womanhood. She goes to school, plays about like other girls, but cannot run so fast or so far as the rest or use bodily exertion beyond a certain amount without dyspnœa and palpitation, and some pain in the region of the heart. For all other purposes she is absolutely well. In examining the state of her heart when she is quite free from all excitement, I find no extraordinary impulse, either of extent or of degree. It is felt only at the apex. Neither do I find any extraordinary extent of dulness to percussion. A systolic murmur is audible everywhere within the præcordial region, most audible at the apex, more faintly at the basis. From the basis upwards towards the right clavicle in the course of the aorta and subclavian artery it is entirely lost, towards the left clavicle and in the course of the pulmonary artery it is very loud, but not at all heard in the carotids. From the apex the murmur extends far round towards the left axilla and the back. Here I presume that the rheumatic inflammation has done a permanent injury to the endocardium on both sides of the heart, and that the mitral valve and the semilunar valve of the pulmonary artery have undergone change of structure.

I have already said that I have known numerous instances of a permanent endocardial murmur, which had its origin in an attack of acute rheumatism, existing for various periods of from one to five years, without any consciousness of ailment except at times of bodily and mental excitement. If the patient's own testimony may be taken to fix the origin of his disease (and there is no reason why it should not), I have seen one instance where these conditions existed for 20 years. A clergyman, 39 years of age, worn out by the cares of his parish, pale, and thin, came to me, and recounted a long catalogue of nervous distresses. He complained too of palpitation of the heart upon any great bodily exertion, or mental excitement, and after stimulant food. And this palpitation I thought would turn out to be nervous too; but auscultation found the loudest endocardial murmur at the apex, and at the basis of the heart, and in the carotid arteries. I fancied there was also a slight excess of impulse, but of this he himself was unconscious at the time, and said he never felt it when quiet, as he then was. Percussion discovered no unnatural extent of dulness in the præcordial region. In truth I was sure of nothing extraordinary appertaining to the heart but the murmur.

Now this gentleman reported that once in his life, twenty years ago, he had suffered an attack of acute rheumatism; that his heart was said to be affected at the time, and he had remedies applied to it, and that from that day to this he had ever been liable to palpitation, not constant, but occasional only, and the inevitable consequence of excitement.

Thus we have been contemplating two conditions which are the result of rheumatic endocarditis; one in which there is a permanent murmur, without the least consciousness of ailment on the part of the patient under any circumstances, and without the least evidence furnished to the physician, from auscultation, of further detriment done to the heart (beyond the original injury of the endocardium) after the lapse of years. The other in which there is a permanent murmur with palpitation and dyspnœa which are occasional only, yet inevitable upon a certain amount of excitement, and still without the least evidence of increasing detriment to the heart, even though years had passed since the original injury of the endocardium.

What then is the essential difference between these two orders of cases? It is probable that the difference respects only the degree of injury sustained by the endocardium. This is not great in either case; but less in the first, where it is enough to produce an eddy of the blood and a vibration among its particles, and a consequent unnatural murmur, yet not enough to occasion such a sensible obstruction to its current as the heart either feels or resents; and greater in the second, where, under ordinary circumstances, it is still not enough for the heart either to feel or to resent, but, when an occasion of accelerated motion arises, it both feels it and struggles against it as an obstacle.

There is yet another description of cases, including those who have a permanent murmur derived from acute rheumatism, and together with it a permanent palpitation. After the subsidence of the rheumatic attack, the patients may recover the aspect, and many of the feelings and functions of health; but their heart is *always* found to beat with somewhat more than its natural force, and with very much more upon any considerable exertion. Now, from this palpitation, conjoined *from the first* with the permanent murmur, I do not know that we can justly infer that the heart has sustained *from the first* a detriment to its structure beyond the injured endocardium. But in such cases, we are apt to think that we shall not have long to wait for the authentic signs of its more extensive disorganisation, and we are apt to look for an earlier incapacity and an earlier death. Yet this need not be: even here the changes for the worse are often very slow. Life, useful and enjoyable life, may endure for years, even (as the following case will show) for twenty-two years, and then afford the prospect of enduring still.

A lady thirty-six years of age, thin and pale, was brought to me by a medical man for consultation upon all the circumstances of a very long abiding malady. The impulse of her heart, always excessive, was augmented to violence upon any exertion. She suffered dyspnœa when she moved about, but no cough, and no expectoration, except on occasion of an accidental catarrh. Her bowels were regular, and other functions were proceeding naturally. On examination of the chest, the lungs were found to admit air freely. The heart was felt beating at every part of the præcordial region, and an endocardial murmur accompanying its systole was heard at the base, and thence becoming louder and louder as it was conveyed downwards towards the apex, and feebler as it was conveyed upwards in the course of the aorta. It ceased abruptly before it reached the subclavian [illegible] and was inaudible in the carotids. It was heard [illegible] and everywhere in the back below the scapulæ.

Now what was the history of this case? At the age of een this lady had an attack of acute rheumatism, and she ctly recollected the palpitation which she then suffered, the remedies which were addressed to her chest. From time forth her chest had never been at ease. At the age ghteen she had a second attack of acute rheumatism, but abitual symptoms referable to the heart were neither vated at the time nor rendered permanently worse after- s. Ten years ago she had a third attack, which for the brought upon the heart an extraordinary amount of ing, but left it no worse than it was before.

his lady married at thirty. She had had one living child everal miscarriages. She had suffered a miscarriage nine s before I saw her, with considerable hæmorrhage, and that time her palpitation had been unusually severe.

enjoined perfect quiet, and recommended that her nervous n should be kept constantly under the soothing influence regoric and ammonia.

saw her a few weeks afterwards. She had lost her pale ssed look; and herself and her medical attendant both red that what she then was might be taken to represent abitual state. All the unnatural sounds of the heart, I had found before, still remained, and nearly the same s of impulse. I considered that the mitral valve was nd, and that the left ventricle was in a state of hyper- y and dilatation, and the aortic valve not altogether ured.

aking then the three descriptions of cases in their order, I e it to be the tendency of each to pass progressively rd into the others. The endocardial murmur left by acute arditis may be simple and alone, and so it may remain for , but it is ever apt to have a palpitation added to it. The ation accompanying the murmur may be occasional only, o it may continue for years; but in the mean time, it is ready to become permanent. The permanent palpitation remain for a while moderate in degree, but it is always ng to become greater and greater. Of these three con- s, then, the best that experience allows us to hope is, that may remain stationary; for their changes are never retro- , but always progressive and always for the worse. Each tion becomes worse as it is converted into the other, and the condition of permanent palpitation passes on to new results, and to the final and fatal event.

The nature of these results will be considered hereafter. In the meantime, remember the important fact which clinical experience has just been brought to testify. It is this—that the evil consequences to life and health arising out of the heart's permanent unsoundness left by endocarditis are often either stationary at a small amount for years, or very slow to advance and accumulate. If a reason of the fact be asked, it will be found in the stationary and unincreasing nature of the original endocardial unsoundness.

LECTURE XXIII.

PERMANENT UNSOUNDNESS FROM PERICARDITIS; ITS MANY DEGREES; SOME HARMLESS.—GENERAL VIEW OF THE EFFECTS OF PERICARDITIS AND OF THEIR REPARATION.—HOW ULTIMATELY INCOMPLETE AND ENDING IN PERMANENT UNSOUNDNESS OF VARIOUS DEGREES.—SOME OF THEM SPECIFIED AND COMMENTED UPON.—CUMULATIVE UNSOUNDNESS FROM SEVERAL ATTACKS OF PERICARDITIS.

WHEN pericarditis has ceased and life is safe for the present, auscultatory signs cannot be appealed to for information respecting the state in which the pericardium is left, as they were after endocarditis respecting the state of the endocardium. The perfect or imperfect reparation of the pericardium cannot be inferred from the entire cessation or the permanent continuance of the exocardial murmur. In truth there is no such thing known (I believe) as its permanent continuance. If life go on, its cessation must follow, whether the pericardium be restored to perfect integrity of structure or not. Being perfectly restored, the healthy surfaces would again glide upon each other freely and without sound. Being imperfectly restored, the unhealthy surfaces would adhere and so abolish the sound which had resulted from their friction. A stop is put to the murmur in both cases, and its cessation proves nothing in either.

From the description already given of the damage which pericarditis is capable of doing, its amount will be seen to vary greatly in different cases. Accordingly, reparation has much or little to do in different cases before it reaches (I will not say) perfect soundness, but that degree of diminished unsoundness, which makes life safe for the present. It is with the last that we are now concerned.

So much of the effects of pericarditis, as, after they have ted reparation to the utmost degree of which they are e, is still found to remain permanently and unalterably, this it is which in each particular case, be it more, or be it less, constitutes the unsoundness.

But when reparation has done its best, how much is actually found to remain? More or less in different cases, but something, I suspect, in all. I am disposed to take it for a fact, that whenever inflammation of the pericardium has been enough to declare itself by symptoms, the detriment done never undergoes perfect reparation; the pericardium never regains its integrity of structure, never, in short, again becomes what it was before it was inflamed. And in as far as it falls short of it, so far, it is permanently unsound: and this may be very little, or very much.

What then is the nature and what may be the degrees of the heart's permanent unsoundness derived from the partially repaired effects of pericardial inflammation, now come to be considered?

There are often found after death, where they have been unsuspected and unlooked for during life, small adhesions of the pericardium, of which the heart never felt the injury, the result of some slight attack of inflammation of which it never felt the presence or the pain. They consist of long loose bands running between the heart and the pericardium, or of a few slender threads between the pulmonary artery and the aorta. [illegible] wherever there [illegible] from the coincidence of the [illegible] that both are the effect [illegible] of which there are [illegible] to match these [illegible] deaths.

[illegible] the adhesion is of [illegible] it must still be [illegible] injury the effects [illegible] repaired. But I can [illegible]

[illegible] after death, where, [illegible] of its existence, [illegible] and its cavity [illegible] a few such cases. [illegible] heart and the dis- [illegible] as other organs. They have however been casual cases, and I had no acquaintance with the conditions of the patient's death, prior to their fatal illness. My observation of them had only been during the last few weeks of their existence, when, if ever, a damaged organ is apt to betray the secret of its unsoundness. But even then, the heart had escaped my suspicion, and after death it disclosed what I never looked for. The cavity of the pericardium has been entirely obliterated by adhesion. Further the adhesion has been effected with the least, or with hardly any, apparent medium of adventitious substance. And, further still, the muscular structure of the heart has been neither thickened nor attenuated, nor any of its chambers unnaturally large or small. Except the complete adhesion of the pericardium and the obliteration of its cavity, the heart has been altogether normal and healthy.

Now these cases I can indeed turn to a practical use. I find in them the explanation how it sometimes comes to pass, that the most acute pericarditis has its termination, not merely in present safety, but also in (what, at least during life cannot be distinguished from) perfect health. I have known a few cases, and a few others have been credibly reported to me, of individuals, who having suffered an unequivocal attack of pericarditis, have, after the lapse of some months, betrayed not the least evidence of an injured heart, and who, in every feeling and function of their bodies, have been as perfectly well as ever they were. But in these cases did the pericardium recover its perfect structure, and were its surfaces everywhere ununited and freely moving upon each other again? I doubt whether this be possible. Or did the pericardium contract a complete and permanent adhesion to the entire obliteration of its cavity, and that by the least conceivable quantity of adventitious lymph? I know that this is possible from the cases to which I have referred, and I know too, although it be a state of imperfect reparation or unsoundness, yet that it is compatible with the perfect functions of the organ, and need not lead to its further disorganisation.

Take one case in illustration.

Louisa Hawkins, a young married woman, twenty years of age, was admitted into St. Bartholomew's Hospital, on the 23rd of June, 1836, suffering from acute rheumatism. Almost all her larger joints were swelled, and red, and painful, and had been so for three days; her left side, too, was painful, and she had short breathing and a dry cough; and withal her heart beat with a genuine exocardial murmur. Her fever ran very high, and her disease altogether was very severe. She was treated by cupping and leeches, and by calomel and opium.

The exocardial murmur preserved its distinctive character for five days; and then for five days it was sometimes present and sometimes absent, and varied in different postures of the body, and then it went away altogether, and left the sounds of the heart perfectly healthy and natural. It took a fortnight from the patient's admission to bring her disease to a close; and then she remained three weeks longer under our observation receiving such help from medicine as her weakness and her shattered nervous system required. At the end of five weeks she was still weak but gaining strength daily, her heart beating with unnatural frequency but without the least unnatural sound.

This was considered to be a case of simple pericarditis, very severe in degree, but arrested by active treatment before it had gone on to produce a large accumulation of lymph. Hence severe as it was and severe as were its remedies and great as was the constitutional suffering, the actual detriment done to the heart was probably not large and the powers of reparation were not highly taxed.

In the month of February, 1837, this young woman came to the hospital to pay a visit of gratitude to the sister of the ward. I saw her. She was the picture of health. She told me that she soon recovered her wonted strength after she left us and that she had been unconscious of the least ailment ever since, and that there was nothing in the way of bodily exertion which she could have done before her illness that she could not do now. After the most careful auscultation bestowed upon her heart by myself and others we could find no fault with it. Its contractions, sounds, and impulses were rhythmical, healthy, and natural, and the præcordial region afforded its due resonance to percussion.—(W. 21, 33.)

This is indeed an encouraging case. Here was no slight or covert or doubtful disease [illegible] g a sure living diagnosis, a manifest peric [illegible] nd depositing lymph upon the surface of the heart. It was treated as such, and its symptoms were abolished and life was saved for the present. Nay! more, after the lapse of eight months every circumstance, which could be taken into account, declared that health was perfectly restored, even the health of the heart, as far as the perfection of its living functions constitutes its health.

In what proportion the genuine cases of acute and lymph-depositing pericarditis, duly and seasonably treated, revert to the conditions of this case, I have no statistics to inform me. But standing alone the case gives an encouraging lesson. It is this, that we should always keep those who have suffered the disease as long under our care and observation as possible. Even when reparation has reached the point at which life is safe, we should not yet abandon them. How much further it may go we cannot tell; therefore we should be ready to give to it every aid and to avert from it every hindrance. We are not sure that it can go so far as to leave the heart perfectly sound of structure. But we *are* sure that it can go to the extent of reducing its unsoundness to so small an amount as to be unfelt as a detriment to the heart's living functions.

But the reparation of the injury done by pericarditis is too often neither thus really nor virtually perfect, but leaves unsoundness enough to be always felt, and enough to become the element of future disorganisation.

The more painfully interesting and (I fear) the larger part of the subject remains. Of this some summary account must be given, viz. of reparation beginning and proceeding but falling short of its ultimate design, and of unsoundness diminished indeed and brought within limits compatible with life, but felt as a present injury and feared as the source of greater injury to come.

Consider the effects of pericardial inflammation. They are the undue determination of blood to the membrane itself, the fluid effused within its cavity and the coagulable lymph adhering to its surface. And then consider how each of them becomes of greater amount in proportion as the inflammation is more severe and of longer duration. Yet, if life be spared
he inflammation has ceased, you may always trust the
f reparation for the entire removal of the two first,
the last.

The removal of the undue determination of blood is the first and the easiest stage towards reparation. Vessels, which naturally contain few red globules, have been distended and overloaded with them, and those, which naturally contain none at all, and are therefore invisible, have admitted them freely. All this results from something (*sui generis* perhaps)—something done or suffered by the blood-vessels and essentially ministering to the part they have to play in the inflammation. And it all ceases when the inflammation ceases as a natural and necessary consequence without (as far as we know) any further organic process whatever.

The second stage is not so easy, but yet not difficult. It is the removal of the effused fluid. This however must be entirely removed before the heart can reach any condition which is compatible with the continuance of life, even *a safe* condition of permanent unsoundness.

The third and last stage towards reparation is the most difficult of all, and doubtful whether it be ever completed. This is the removal of the solid lymph. Removed altogether (I suspect) it never is, and what remains of it, after reparation has done its best, constitutes the permanent unsoundness.

But the solid and fluid products of inflammation within the pericardium bear a certain relation to each other in the process of their removal. Therefore we will take them both together in considering how it comes to pass.

Inflammation having ceased but lymph still abiding upon the surface and serum within the cavity of the pericardium, the best event, now to be presumed possible, is that its opposite folds should adhere and its cavity be entirely obliterated. And this adhesion is unquestionably a process of reparation: of tentative reparation if you please, but still of reparation. It does not succeed in bringing back sound and healthy structure, but it does succeed in rendering the effects of the disease less intolerable and less incompatible with the continuance of life, than they would have been if no such adhesion had taken place.

Now adhesion [illegible] when the opposite surfaces of the pericardium [illegible] and through the same [illegible] opposite edges of a wound, and it is [illegible] the same impediments. Bring the [illegible] Keep them apart, and they cannot adhere, although the lymph be ready formed to serve as the medium of their adhesion. And as soon as the opposite surfaces of the pericardium, being already coated with lymph, are fairly applied to each other, they begin to adhere. But a large quantity of serum accumulated within its cavity, and holding its surfaces at a distance from each other would preclude for the time the possibility of their union. And the quantity of serum may be large indeed.

Large however in point of fact it seldom is. It would almost seem among the characteristics of inflammation, when it falls upon the pericardium, that its solid should greatly exceed the amount of its fluid products. In our clinical diagnosis of pericarditis, the important fact was particularly noticed, that the exocardial murmur, the sure evidence of solid matter rubbing against solid matter, was heard early and continued to be heard in almost every case without intermission, until it finally ceased altogether; and the fact too that, however soon after its final cessation the patient died, the pericardium was found beginning to adhere. Thus the fluid within the cavity seemed from first to last not enough absolutely to prevent the opposite layers of lymph from coming in contact.

No sooner is this fluid, whether it be much or little, absorbed and gone, than the solid matter is left to contract adhesion, as it may and as it does, forthwith.

Now this process of adhesion begins with a larger or smaller quantity of coagulable lymph according to the extent, the intensity and duration of the previous inflammation. But whether it be large or small, the quantity with which the adhesion begins is probably in all cases more than is needed to render it complete and permanent. Therefore nature seeks to preserve just so much only as is essential to her purpose, and all the rest which can only be a hindrance to its perfection, she strives to remove. But this perfection which nature intends is more than nature can achieve at all times.

Any adhesion, which, occurring after acute pericarditis, enables life to go on however insecurely, and the heart to perform its functions however imperfectly, is a reparation. But the adhesion, which further guarantees the continuance of life and enables the heart to perform its functions in a manner approaching to the conditions of health, is a reparation in a

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from the

higher sense. And to do this it must be of a certain kind and degree.

Be it however remembered, that all adhesion of the pericardium, whatever be its kind and degree, although in reference to the preceding inflammation it partakes of the nature of reparation, yet in comparison with original structure, and with reference to consequences, partakes of the nature of unsoundness. Only its character of reparation is more apparent in one case and its character of unsoundness in another. The former has been illustrated by some conspicuous instances. It is the latter with which we have now chiefly to do.

The most common appearances of disease are often the fullest of instruction, and to such I am now going to refer. When there has been only one known attack of pericarditis, occurring long enough ago to allow as complete a reparation of the injury left behind as might be possible in each case, then the customary appearances on dissection are some of the following:—

1. There may be an universal adhesion of the pericardium and a complete obliteration of its cavity effected by the least, or by hardly any, apparent medium of adventitious substance. Here we have an example of reparation nearly complete but not of absolute reparation: of the least degree of permanent unsoundness but still of unsoundness. It has been shown, that these conditions may subsist without further harm to the functions and structure of the heart. But then it was where there had been no known previous attack of acute inflammation. Hence however, it was thought fair to conjecture that where there had been a previous inflammation and life had afterwards gone on without the least evidence of further harm to the functions and structure of the heart, these same were the conditions which might have obtained. I say, "it was thought fair to conjecture" and that is all. For, although I have known a few who after simple acute pericarditis have recovered and lived apparently in perfect health, yet I have never had the opportunity of examining after death the state of the heart in any such instances. I have indeed often met with "this almost complete reparation and this least degree of unsoundness" appertaining to the pericardium after death, where inflammation had been formerly suffered. But it has been accompanied with unsoundness of the endocardium also, and further disorganisa-

tion in the shape of a thickened muscular structure, and of a dilated ventricle has been superadded, and all have been notified by symptoms during life. It is a question with me then after all, what are the consequences which naturally result to the functions and structure of the heart from simple adhesion of the pericardium. For I have not facts enough to appeal to of the sort which are required to settle it. Pericarditis indeed is common enough; but not simple pericarditis. The original disease is oftener a complex of pericarditis and endocarditis than pericarditis alone; and the original unsoundness a complex of the partially repaired effects of both. Hence whatever detriment the heart is afterwards found to suffer in its functions and organisation, it is difficult to make sure either how much is due to each, or whether the whole may not be imputed to one; how much the thickened valve produced, and how much the adhesion of the pericardium; or whether the thickened valve may not have been exclusively the source of all the mischief, and the adhesion of the pericardium altogether blameless from first to last.

2. But, instead of the adhesion of the pericardium being universal, and the obliteration of its cavity complete, both may be partial only; partial, however in different ways. There may be a single adhesion over a considerable space, limiting the one cavity by so much. Or there may be many adhesions partitioning the one into many cavities. These partial adhesions are often very firm and close, and in their interspaces the surfaces of the pericardium are found lying in contact and ununited and apparently healthy.

Now measuring and comparing things as they merely strike the eye, we see in these conditions a less amount of unsoundness, than in a pericardium altogether adherent and having its cavity altogether obliterated. But looking to consequences we must judge otherwise. These loose interspaces are prone to entertain inflammation afresh. After death from secondary pericarditis the heart has been found apparently surrounded with many little separate abscesses, which have turned out to be collections of purulent matter between the folds of the pericardium, where it had here and there failed to contract adhesion after a former inflammation.

In the radical cure of hydrocele, more is needed, that we may make sure of it, than to draw off the fluid. Let it be drawn off twenty times, there is still a fear that it will in all probability return, as long as there remains a serous cavity for it to return to. The cavity itself must be obliterated, and surgery designs and interferes that it shall be so. It aims to produce throughout the entire sac just so much inflammation as shall cause to be deposited, not here and there merely, but on every part of its opposite surfaces lymph enough, but not more than enough, to procure their adhesion. The absolute obliteration of the cavity of the tunica vaginalis by adhesion with the least possible quantity of adventitious matter, constitutes the radical cure of hydrocele. Here what is surgically the radical cure in reference to one organ is the same, which medically in reference to another I have called "almost complete reparation and the least degree of unsoundness." Whatever be the security against recurring disease in the one case must be the security in the other.

3. But it is not only the extent of the adhesion that is various, but the quantity of the uniting medium also. Between a slender tissue that holds, almost invisibly, the opposite surfaces together, and a solid substance half an inch in thickness, there is found every intermediate degree. And these extremes and several intermediate degrees are apt to be found in the same heart, displaying larger and smaller measures of unsoundness at different points, and a vast aggregate of unsoundness upon the whole. Now this state of things may be met with at remote periods after some known attack of pericarditis, from which there has been no return to health, but ever afterwards a sensible hurt and hindrance to the living functions of the heart and a miserable existence. The unsoundness is both permanently great and unalterable for the better. Reparation has been able just to save life, and allow it to go on and nothing more. I say unalterable for the better, but not unalterable for the worse. For here are just those conditions which involve the peril of secondary inflammation.

Such, generally, are the forms and degrees of imperfect reparation found after a single attack of pericarditis. They are in fact forms and degrees of permanent unsoundness. They are calculated to interfere some more and some less with the natural functions of the heart, some to bear heavily and some lightly upon a man's future well-being, some greatly to abridge the span of life, and some still to allow its long continuance.

But there is a cumulative unsoundness resulting from more than one attack of pericarditis. To the imperfectly repaired detriment done by a first inflammation may be added the detriment done by a second. And this too may be imperfectly repaired; and thus, after several inflammations, each adding something to the permanent injury which it found, if life continue, the cumulative unsoundness may ultimately become enormous.

Of this cumulative unsoundness something has already been said incidentally in a former lecture, when I gave certain cases and dissections to illustrate the clinical history and diagnosis of secondary inflammations of the heart, and in the present lecture when, describing the forms of unsoundness left by a first pericarditis, I pointed out those which rendered the heart more apt to entertain a second. Hence it must appear, that there are cases in which after death the effects of a second or any after-attack of pericarditis are plainly distinguishable in the same heart from those of a first or of prior ones, the cases namely where from such second or after-attack the patient has recently died. But these show the beginnings only of that cumulative unsoundness, of which something yet remains to be said. I will content myself with first describing it simply as it appears when it has run on to some of its highest degrees, and afterwards add a brief commentary.

The adventitious substance intermediate between the adhering folds of the pericardium has been found more than an inch in thickness, its texture sometimes laminated like the coagulum of an aneurismal sac, red or tawny near the heart, and pale or white more remote from it, sometimes of a mixed consistence, in part almost liquid and purulent and in part solid or tuberculous. Or the adventitious substance has been of one uniform texture, either so like muscle as to be at first mistaken for the fleshy substance of the heart itself, or so far firmer than muscle as to resemble flesh hardened in brine, either much paler than the heart, or much redder from being deeply injected with blood. This tough flesh-like substance may occupy a portion only of the surface of the heart or the whole of it. I have seen it opposite the right auricle, while every where else the pericardium has closely adhered with little intervening medium, and I have seen it enveloping the entire organ and forming round it (as it were) another case of muscle. And then, if (what often happens) the muscular substance of the heart itself be augmented, a strange spectacle is disclosed on dissection. There is an enormous mass displacing the lungs and leaving nothing visible in the entire front of the chest but itself.

These results are very striking. But can we interpret them truly? Can we take them and read them (as it were) backwards, and so tell the course and clinical history of the inflammation or inflammations which produced them?

In all cases, from what we know or from what we learn of the patient's previous life, this one point is clear beyond a doubt, namely that the vast amount of unsoundness had its start or point of departure from an attack of pericarditis several years ago. And in many cases from what we know or what we learn, thus much more becomes certain or highly probable, namely that the original unsoundness received accessions from distinct subsequent attacks of inflammation. We seem to read thus much in the character of the morbid deposits, when there are layers of lymph upon lymph varying in colour and consistence, or when matter soft and friable intervenes between firm and tough adhesions.

But in other cases, neither from what we know nor from what we learn of the history of the patient's life or the nature of what is found after death, can we get all the sure insight we desire into those morbid processes, which succeeding to the original pericarditis have built up the vast mass of unsoundness eventually disclosed. The original pericarditis, we are told, left behind it præcordial anguish and palpitation, and these never afterwards ceased but became greater and greater to the last. But in the mean time it is uncertain whether there were any fresh attacks of inflammation or not.

In such cases we are left to choose between two reasonable conjectures. Fresh and distinct attacks of inflammation might have arisen and brought their contingent to the original unsoundness and yet all sure notices of them have lain concealed under the magnitude of the abiding distress. How possible this is, has been already shown when we were considering the diagnosis of secondary pericarditis. Or, without any fresh or distinct attacks, the adventitious texture first formed might still continue to entertain the inflammation which formed it, and so carry within itself the principle of its own increase. This, being ever afterwards slowly but ceaselessly at work, goes on to amass by interstitial deposits a greater and greater cumulative unsoundness. The uniform colour and consistence of the adventitious substance seem to countenance this last conjecture.

LECTURE XXIV.

PERMANENT UNSOUNDNESS OF THE ENDOCARDIUM AND PERICARDIUM FROM DISEASES OF A SPECIFIC AND MALIGNANT NATURE, ESPECIALLY FROM ANALOGOUS FORMATIONS.—THEIR ANATOMICAL CHARACTER.—THEIR CLINICAL HISTORY.—THEIR CLINICAL DIAGNOSIS.—OUR KNOWLEDGE OF THEM COMPARED AND CONTRASTED WITH OUR KNOWLEDGE OF INFLAMMATION.

Thus far we have been considering the permanent unsoundness derived to the heart from *disease*, and that disease inflammation, and that inflammation of the pericardium and the endocardium; in other words the local effects of one or of several attacks of inflammation upon these structures when they are left imperfectly repaired. But permanent unsoundness may be derived to the heart from disease, and that disease be of the endocardium or the pericardium and yet not have the nature of inflammation.

The several textures which compose the heart are not exempt from these diseases which, by whatever name they are called, result in formations different from the natural structures of the body, such as tubercle, carcinoma, cephaloma, &c. But these diseases have not any special pathology respective to their seat [illegible] to our purpose, or any distinctive history, [illegible] treatment. Therefore it would be going [illegible] notice of them. I would only [illegible] which experience has made us most [illegible] the heart. I have in a few rare [illegible] with scrofulous tubercles, [illegible] with tubercles of the same [illegible] body and especially in the lungs. [illegible] have a natural preference for one [illegible] another. Its tubercular deposits are [illegible] take place in a single part and then, if life continue, [illegible] parts almost in a certain order. And life not [illegible] enough to allow them to spread beyond the part first and chiefly and fatally affected, and to reach two or three others. Yet they seldom reach the heart.

But the heart is apt to derive permanent unsoundness from diseases (if they deserve the name) different from all these, and different too from inflammation. They consist of (what are called) deposits of analogous tissues: analogous, that is, to healthy tissues, as partaking of their nature, but now having the character of disease, since they now occupy the situations where in health they are never found. Thus cartilaginous and osseous matter is found in the pericardium and the endocardium. It is not indeed either perfect cartilage or perfect bone, but it approaches to the one or the other both anatomically and chemically.

Now the strict local pathology of these analogous tissues, the manner of their origin and growth and increase within the heart I must leave you to learn from other instructors. Our proper business is with their *living* history and their diagnosis and their treatment. But some idea of their objective reality should be brought and kept before the mind, if we are to take any just measure of their living events and form any just expectations of the effects of remedies upon them. A few particulars therefore concerning them require to be briefly stated.

The endocardium is much more frequently the seat of these analogous formations than the pericardium. But a specimen of ossified pericardium is to be found in most museums.

In the specimens I have met with, the manner in which the bone has been deposited has been very peculiar: it has constituted one large plate or ring, running round the heart; or even a sort of case, which has nearly enveloped the whole organ. From this ring, or case of bone, processes sometimes are given off, which penetrate the substance of the heart, and reach even to its cavities.

Laënnec met with an instance in which this sort of bony case was formed around the heart, and gave off processes, which penetrated its cavities in the manner described: and he satisfied himself by dissection that the morbid growth was developed between the fibrous and serous layers of the pericardium, since he was able to separate it, and still leave the heart covered by the serous fold of its investing membrane.

In the endocardium analogous formations are more various and more frequent. Cartilaginous depositions are often found beneath the membrane where it is single; or between its folds where it is double, in the situation of the valves; and thus they seem rather to belong to some structure contiguous to the membrane than to the membrane itself. Such depositions will proceed to a considerable extent, while the membrane still remains free from disease. From a valve, which has been thick, opaque, and cartilaginous, I have seen the membrane separated on both sides, and transparent; the opaque and cartilaginous matter being left behind. Where, in cartilaginous depositions, the lining of the heart has become puckered and uneven on its surface, and the valves shortened and altered in their shape, the membrane itself participates in the disease, and is generally incapable of being separated from the subjacent structure. But great thickening may take place in the situation of the valves, from deposition of cartilage, without any unevenness of their surface or alteration of their shape; and under these circumstances the membrane itself you may expect to find hitherto exempt from disease.

Osseous depositions are always, I believe, originally formed beneath, or exterior to, the membrane, both in the heart and in the arteries. There are two circumstances especially worthy of remark in this process of ossification: sometimes it is a pure and unmixed process: bone is formed and nothing else. It is deposited in minute granules, or little brittle scales, or in plates of a larger size; and the intermediate spaces, whether in the heart or arteries, preserve their natural and healthy appearance. At first, these granules or scales, or plates of pure bone, are covered by a delicate pellicle, which is in fact the internal membrane of the heart or artery, separating them from the immediate contact of the circulating blood. But in process of time, as they increase in size, and become rough and unequal on their surface, they cause a rupture of the internal membrane, and have now nothing to separate them from the immediate contact of the blood.

Sometimes ossification is a mixed process, or rather, the result of another morbid process preceding it. With the cartilaginous depositions already described there is an admixture of bone. The quantity of bone generally bears a small proportion to the cartilage when they both occur together, as if the bone proceeded from the cartilage, and not the cartilage from the bone. It is sometimes seen growing from the surface of the cartilage, and is sometimes deposited in its substance, and only detected by the knife.

Enough has been said of these analogous formations to show that they constitute a real unsoundness of the heart. But *whence* come they, and *why* come they in the living man? Have they any clinical history which can tell us? Assuredly they *have* a clinical history, but it is no such history as that which belongs to an acute endocarditis or pericarditis. They have no sudden fever, no abrupt pain or swelling of external parts, in the midst of which they declare themselves for the first time, and which fix the exact date of their origin and give intelligible intimations of their very nature. Yet still they have a clinical history, but it is such as belongs to all *chronic* disease.

When disease is essentially acute, the preceding circumstances conducive to it are (so to speak) acute also. They are often as marked and as palpable as the disease itself, and we seldom need to look far back before we find them. The pneumonia of to-day comes from exposure to cold which was bitterly felt yesterday. The fever of to-day comes from exposure to some known contagion or some malarious influence in the course of last week. The endocarditis and pericarditis of to-day are only what we have been expecting and fearing since our patient has been ill of acute rheumatism.

But when disease is essentially chronic, the preceding circumstances conducive to it are (so to speak) chronic also. They are often covert and far-fetched and hard to unravel, and we must often look back to a man's whole life, or to the life of his progenitors, before we find them.

Thus in a multitude of cases (for when the question is of chronic disease a single case proves nothing) where the lining membrane of the heart and arteries has been beset with cartilaginous or atheromatous or earthy deposits, the patients have been habitual spirit drinkers for years, and the most conspicuous conditions antecedently presented by them have been the failure of many functions and the growth of structural disease in many organs, especially in those subservient to nutrition.

Again, in a multitude of cases the patients have not been grossly intemperate but habitually luxurious, and the ailments chiefly suffered by them beforehand have been gout and its concomitants.

Again in a multitude of cases the patients have always lived in the way most likely to ensure health, and health they have always enjoyed until old age has arrived; and then have appeared the authentic signs of valvular disease of the heart.

But, when all these circumstances have been noted and allowed, they only make one feel more strongly the need we have of knowing something more. The history of diseases, as distinct from their diagnosis, is valuable in proportion as it shows what are their natural preparatives, and what are truly their exciting and predisposing causes.

Intemperate habits, and gout and the gouty constitution and its appurtenances, and old age, all deserve our notice as belonging to the history of the heart's unsoundness produced by chronic valvular disease. But intemperate habits, and gout, and old age must include within them something more general, something common to them all, something working more expressly to its end, and determining the formation of cartilaginous and osseous growths within the heart and arteries by a more direct pathological necessity. But what it is we know not.

We talk sometimes of diseases which come of themselves, meaning that they come without any sure forewarning that they *are* coming. And yet it is probable that such diseases, which are mostly chronic, are more strictly annexed to preceding conditions, although it cannot be shown what those conditions are, than are acute diseases. A man may have acute rheumatism and yet escape inflammation of the endocardium or the pericardium. He may be exposed to malaria or to contagion, and have no fever. He may encounter a blow, or a fall, and suffer no hurt. Here the conditions which precede are plain enough, and so are the diseases which follow, when they really *do* follow. But the fact that they do not always follow takes them out of the category of inevitable consequences. And further, when they do follow, whether they be fevers or inflammations, they are cured, if they be curable, irrespective of the conditions out of which they arose. Being once produced they are set free from subjection to the causes which produced them, and thenceforth yield obedience to influences either inherent in themselves, or brought to bear upon them from without. Hence they sometimes cease spontaneously, and sometimes on the application of remedies; such remedies as operate plainly in counteraction of present morbid conditions, as, for instance, anodynes for present pain, salines for present fever, bleeding for present hardness of the pulse. But with chronic diseases it is often far otherwise. While all that has preceded them has been so little remarkable as to lead us to believe that they came of themselves, yet when once they have declared their existence, then everything has seemed to show that they had their origin and still have their continuance from a root much deeper than themselves. And if such diseases be curable, they are not cured by remedies counteractive of present morbid conditions, either by anodynes for present pain, or by salines for present fever, or by bleeding for present hardness of the pulse. There may be pain enough, or fever enough, or hardness of pulse enough, and these may require their appropriate remedies, anodynes and salines and bleedings, and they may yield to them. But while they yield, the diseases remain, because they are indissolubly annexed not to those conditions which we see, but to other conditions which do not appear.

Well! then by what remedies *are* essentially chronic diseases cured, when they are indeed curable? By remedies whose effects from day to day and from week to week are inappreciable, and are seen only after the lapse of years. And what are those effects which are thus tardily and gradually brought to pass? Indeed they can only be expressed in very general terms; terms sufficiently denoting their reality and the imperfection of our knowledge concerning them. Those effects are the change of constitutional weakness into strength; the change of the solids and fluids of the body from pravity to healthfulness, and in the meantime the disappearance of the disease.

It appears then that these analogous formations in the lining membrane of the heart, which occasion its permanent unsoundness, have no such clinical history as can furnish us with any certain knowledge whence or why they come, or with any sure indications of treatment by which they can be prevented or cured.

But being once formed, have they not a clinical diagnosis?

Indeed they have; a diagnosis, which, in one point of view, reveals more than could have been conceived possible of any internal disease, but which in another reveals nothing at all. By present living symptoms we can ascertain their *seat* satisfactorily enough, but we cannot pierce through it into *their nature*. And herein they share the common condition of almost all internal chronic diseases, in which the easy and often sure diagnosis of *their seat* is strikingly contrasted with the dark and conjectural diagnosis of *their nature*.

Now this condition, if it be indeed as general as I represent it, is surely worth enquiring about. Besides it is a condition which bars the rational treatment of all the diseases that it embraces. And if this large class of diseases of the heart, which has long been familiar to our knowledge *anatomically*, still remain far beyond our reach *remedially*, we are fortunate, for our own credit's sake, in being able to show that the obstacles in the way of our art are really insurmountable.

Of the signs by which physicians become acquainted with diseases in the living body, some are expressive of their nature, and some are expressive only of the parts they occupy. The first flow directly from their essence, and may be called essential symptoms: the second are derived from the disturbed functions and sensations of particular organs, and may be called accidental. This distinction between essential and accidental symptoms is one of great practical importance.

Some diseases have both orders of symptoms most strongly marked. An acute inflammation has its essential symptoms, which are commonly the same, in whatever part of the body it is found, such as general heat and general excitement of the vascular system. And these teach us that it really is an acute inflammation, and how to treat it. Moreover, it has its accidental symptoms, which are different according to the part it occupies, whether the heart, the lungs, or the brain, such as palpitation in one case, impeded respiration in another, and disturbance of the senses and the intellect in a third. But these alone teach us nothing concerning the inflammation, and give us no guidance or direction in the treatment of it.

Again, some diseases have no essential symptoms whatever but those only which are accidental, and which appertain entirely to the organs they occupy. A fungous excrescence, or a scrofulous tubercle, being situated in the brain, may be accompanied by a pain in the head, an hebetude of the senses and intellect, and an impaired exercise of the voluntary muscles; but the same symptoms have arisen from tumours of other kinds, and even from the lodgement of a foreign body, such as a musket ball, in the same situation. They have nothing to do with the essence of the tumour in question, and profit us nothing in suggesting any method of cure. They have, in fact, no rational treatment; and simply for this reason, because they have no essential symptoms.

The symptoms which flow from the essence of the disease are present with its very beginning, and accompany the whole process of its formation; whereas the symptoms which are accidental to it do not always appear until it is already formed, and often not until it has endured for a considerable period, and reached a considerable magnitude. Further, it may be stated generally, that essential symptoms belong more especially to acute diseases, and that diseases, in proportion as they are more chronic and of (what is called) a specific character, are apt to lie concealed under symptoms which are derived less from their own nature than from the parts they occupy.

With respect, then, to diseases of the heart, as far as they are declared by essential symptoms, we have an early intimation of their existence, a knowledge of their real nature, and a guidance in the administration of remedies for their cure; but as far as they are suggested by accidental symptoms only, our knowledge is not of their nature but of their effects, and our treatment is not directed to their cure, but to the palliation of inconveniences which are consequent upon them.

Between endocarditis and pericarditis, and the cartilaginous, atheromatous, and osseous transformations of its lining membrane there is this wide distinction, that the former are of an acute, the latter of a chronic character; and this real difference in their nature determines the difference in the degree of knowledge we have concerning them. As morbid anatomists, we can see and describe the visible characters of both with equal precision; but as physicians, seeking to mark the period of their origin, and to measure the rate of their progress, as the indispensable conditions of adapting a remedy to their cure,—as physicians, we know much that is certain and useful concerning one class of diseases and very little concerning the other.

Endocarditis and pericarditis, by virtue of symptoms which are essential, and derived from their own nature, of symptoms which are present with their beginning, and accompany the act of their formation, submit themselves to medical treatment with tolerable success. They often bring the knowledge of their existence within the period which includes the possibility of their cure.

But these analogous formations of the lining membrane having not essential but only accidental symptoms, merely discover *where they are*, not *what they are*, or how they are to be treated. The time of their accession, and the early stages of their progress, are alike unknown; and the notice of their existence is only at length supplied when new changes of structure have arisen in the heart itself, and new disorders in the constitution at large, and both the original and all the consequent maladies are absolutely incurable.

Disorganisations of the heart, how complex soever and extensive they may be, have often their origin in the unsoundness which remains after endocardial or pericardial inflammation, or in that which results from these analogous formations. If in the former their history is capable of being traced from their commencement, and pursued throughout their course regularly and connectedly; if in the latter, their history must be taken up at a period remote from their origin, and will always be most doubtfully and imperfectly made out.

LECTURE XXV.

DISEASES OF THE HEART'S MUSCULAR STRUCTURE.—ACUTE INFLAMMATION TERMINATING IN THE FORMATION OF PUS.—CASES. —EXPLANATION OF THE NATURAL DIFFICULTIES IN THE WAY OF ITS DIAGNOSIS.

I MAY seem perhaps to have passed by all consideration of the muscular structure of the heart, as if it were altogether incapable of disease. But I have only postponed it, thinking that its diseases might be advantageously regarded in contrast or comparison with those of other structures which have already been the objects of our inquiry. For indeed the muscular structure of the heart *has* its diseases; yet many of them are during life brought within our knowledge only in very small measures and degrees, and some of them not at all.

But it is a great thing, let me tell you, to understand the imperfections of our knowledge, and so to analyse its defects, as to be made aware what parts of a subject still remain (as it were) in the shade, and need to be brought into clearer view by the light which future observation may bestow upon them. Therefore, in reckoning what information we have concerning diseases of the muscular structure of the heart, I shall be careful to point out what we have not. By its diseases, I mean processes essentially morbid, which bring change and detriment to its elementary texture, not mere alterations of size and shape and capacity, leaving the elementary texture otherwise unchanged and uninjured; a distinction most needful here to be borne in mind.

The muscular structure of the heart is capable of acute, pervasive, pus-depositing inflammation. But this inflammation has no customary assemblage of preceding or concomitant circumstances, *i.e.* no clinical history to tell us when to expect it, no sure diagnosis to tell us when it is present, and consequently no definite indications of treatment either for prevention or cure.

A boy, twelve years of age, was in perfect health on Saturday night and dead on the following Tuesday afternoon at two o'clock. He had in the opinion of all who saw him the severest inflammation of the brain. The attack was sudden with great heat and frequency of pulse. He had delirium and convulsions and pointed to his forehead as the seat of his pain. At length he sank into a state of insensibility and died. Upon dissection not a vestige of disease was found within the cranium, but the heart was the seat of the most intense inflammation pervading both the pericardium and the muscular substance. Four or five ounces of turbid serum with flakes of coagulable lymph floating in it were found in the cavity of the pericardium, which had its internal surface covered in various situations with a thin layer of reticulated lymph. Thus far there were the evidences of acute inflammation of the pericardium at an early stage. There was no adhesion of the opposite surfaces; the lymph and the serum had been effused together, and the serum had partially washed away the lymph as it was deposited. Further, when the heart itself was divided, the muscular fibres were dark-coloured almost to blackness, loaded with blood, soft and loose of texture, easily separated and easily torn by the fingers; and at the cut edges of both ventricles small quantities of dark-coloured pus were seen among the muscular fibres. The internal lining was of a deep red colour without any effusion of lymph.

Here the acute inflammation of the muscular structure was evinced in a manner which had never been seen before. The softening and friability of its texture would perhaps have been enough to bespeak it inflamed, but here was an actual deposition of pus.* This was a singular specimen of disease. It happened thirty years ago. But I have never seen another like it; and I only know of one other like it, which occurred twenty years afterwards to Mr. Salter of Poole. I will endeavour to abridge the case, taking as much care as I can to preserve its points of interest and instruction.

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* This case was reported by Mr. Stanley thirty years ago. I was witness of it at the time, and present at the examination after death.—*Med. Chir. Trans.*, vol. vii. p. 323.

A man 50 years of age, by trade a glover, but formerly a dragoon, applied to Mr. Salter for advice and gave this account of himself. Six weeks previously, while walking, he was seized with pain at the lower part of the chest inclining towards the left side. It was of short duration but of extreme severity, producing faintness and cold perspiration. A week afterwards, returning from a walk of three miles, he was seized with the same sort of pain with the like fearful accompaniments. And now the attacks became more frequent but varied in their degree of severity and in the occasions producing them. They sometimes arose independent of exertion or seemed to arise from the mere act of raising the arm. At length a considerable uneasiness of the left arm often attended the pain in the chest. Auscultation could find nothing wrong either in the heart or in the lungs. The symptoms obtained some degree of relief from certain remedies addressed to the stomach and bowels, which their present disordered state seemed to call for.

Six days after Mr. Salter first saw him, and seven weeks after his first attack, he was seized with his longest and severest, his last and fatal paroxysm. It continued sixty-five hours and never ceased until it killed him. Its accession was with the consciousness of coming death. His face became all at once pale and his features sharp and his expression anxious and his breathing oppressed. He could not lie down. He placed his hand over his sternum and said "it all lies here." The pain was now a dull heavy pain. Still the heart's action was natural, air passed freely through both lungs and the pulse beat regularly 80 in a minute. He was bled to 10 ounces and blistered. This was early in the morning.

In the evening his sufferings and anguish were the same in kind but vastly augmented. They were too great for him to express what he felt; too great to allow any satisfactory examination to be made of his chest. The pulse had lost in power and gained in frequency. It had reached 120. He was now ordered four grains of calomel and one grain of opium every four hours. The night was passed in indescribable distress. The next morning he was still alive; yet the beats of his pulse were scarcely to be felt or the sounds of his heart to be heard. The surface was losing its heat and positive pain was less. He continued however to live through that day and through the following night and through the next day until eleven at night, with all his extremities cold and his pulse imperceptible, and then died, his mind remaining clear to the last.

Now in this case it was pretty evident that the heart was the seat of disease. But no experience which I possess could have enabled me to say, during the life-time of the patient, what that disease was. These were the appearances upon dissection. In the pericardium both where it was loose and where it covered the heart, especially opposite the left ventricle, there was excessive vascularity; and where it was attached to the diaphragm the excessive vascularity was mixed with ecchymosed spots and blotches. But there was neither serum nor lymph nor pus effused from any part of the membrane. Within all the cavities of the heart coagula were largely accumulated. But there was no vestige of disease at any part of the internal lining. The great centre of disease was the muscular substance of the left ventricle.

"Excepting a small portion of a few lines in thickness on either surface, the left ventricle had entirely lost its muscular colour; it was of a lightish yellow hue but still preserving the fibrous character of muscle. From all the cut surfaces of the various sections, which were made, could be scraped purulent matter. In some parts absorption had taken place leaving small cavities in the muscular substance, varying from the size of a pin's head to that of a small pea. These were all filled with pus."

What was further found, viz. half a pint of serum in the right pleural cavity and the complete engorgement of the left lung with sero-sanguineous fluid, might be looked upon as the result of the last day's agony.

Upon a review of the whole case Mr. Salter comes to the following conclusion. It appears sound and just and embraces (I believe) the real truth of the matter. It is this; "that a chronic inflammation of the muscular substance of the left ventricle of the heart constituted the primary disease and that it no doubt existed at the time the first symptoms occurred: [this supposition, if correct, explains the effect of bodily exertion, even of the most trifling kind, occasioning so much distress:] and that the accession of the violent symptoms may have arisen from the inflammation then assuming an acute form and extending to the pericardium."*

What a lesson do these two cases contain! Watched by competent observers from first to last and from hour to hour with curious and earnest interest they baffled all reasonable calculation of what was going on during the life of the patients. And yet after death dissection disclosed the commonest and the best understood (so we think) of all diseases, inflammation; inflammation, which had begun and proceeded in its most ordinary manner, and which had ended in its most ordinary event, suppuration. But it was inflammation of the *muscular substance of the heart.*

So it was not the nature of the disease that lay at the root of the mystery, but the part it occupied. For be the nature of a disease ever so well known, prior to experience who can tell how any living organ will be affected by it? But there was not *then*, and (as far as I know) there is not *now*, beyond what these two cases have taught, any experience in the world, how the living heart is affected by acute suppurative inflammation of its muscular substance.

And what now have these two cases really taught us? Have they left (what may serve for) a traditionary experience to future observers enabling them to discern and to treat acute inflammation of the heart's muscular substance in the living man? Surely they have not. They have taught the possibility of such a disease in such a part, and nothing more.

Yet do these same cases contain a lesson of a more general and comprehensive kind. And we should do well to consider it. In showing us our defective knowledge of the disease in question, they allow us to catch a glimpse of a great pathological secret. They give us some intelligible notion why the most acute diseases often are, and needs must be, imperfectly developed in their living signs.

The general vascular system and the general nervous system serve each as a glass in which we are fain to read the reflection of diseases, when we have no direct vision of the diseases themselves. Here, as in higher philosophies, we take measure of things by their shadows.

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* Med. Chir. Trans., vol. xxii. p. 72. Mr. Salter's valuable paper should be carefully studied. I hope it has not suffered injury at my hands in the attempt to condense it.

Diseases which are local in their seat and origin are said to have their constitutional symptoms. By this nothing more is meant than that they affect the general vascular system or the general nervous system in certain ways. Affecting the vascular system they produce the phenomena of fever, cold and heat and perspiration, either of them alone or mixed, or interchangeably with one another, also strange movements and impulses of the heart and arteries, and strange acceleratings and retardings of the blood itself. Affecting the nervous system they produce new and strange sensations of infinite kinds and degrees, pain and anguish, excitement and depression, and, when they reach the nervous centres, as they often do, delirium and convulsions.

From these several modes of action and suffering in the vascular system and in the nervous system we gather that portion of our knowledge of diseases which is most eminently practical. For, however sure an insight we may have into the essential processes which constitute diseases within any part, we cannot stir a step safely or profitably in their treatment, until we learn how the vascular system or how the nervous system is affected by them, provided they be of a nature to affect these systems at all. Where are the signs to be sought of acute inflammation when it occupies an organ out of sight? Where the signs by which we are to make sure of its existence, to measure its force and the rate of its progress, and to apply the remedy? Mainly in the general vascular system and subordinately in the nervous.

Well! but do all diseases of the same nature, which are capable of affecting the constitution, display themselves in their constitutional symptoms at all times after the same manner and to the same perfection? Does inflammation do so? I think not. And herein lies one secret at least of the defectiveness of our knowledge.

Call them sympathies or what you will, by which all the blood-vessels and all the nerves of the body share the actions and sufferings of a part diseased, they must have invariable relations and a constant order, if the phenomena which they display are to be constantly relied upon. But the mere magnitude of the disease, or the part it occupies, or the temperament of the patient is ever interfering a little with these constitutional sympathies, and is ever disturbing a little their natural relations and order; not more however than we can easily make allowance for. And if this were all it would be well. But sometimes the mere magnitude of the disease and sometimes the nature of the part and sometimes the temperament of the patient, one or all, so utterly confound them and their relations and their order, that either they cannot tell us what they ought to tell us, or they tell us what is absolutely false.

Most frequently it is from the nervous system that the whole perplexity takes its origin. The nervous system will run on to such an excess of sympathy as to seem to engross all living action and suffering and allow nothing to appear in the body but what directly proceeds from itself. It will tyrannize (as it were) over the vascular system and keep it under, and forbid it to display by its appropriate sympathies those diseases which cannot otherwise be displayed at all. I am well aware that this is not pathological language. It does not explain the processes of things, but it may serve to characterise their results.

In the first of those two remarkable cases which have been related, the sympathy of the nervous system was a mixture of action and suffering but chiefly action, and so intense, so plenary and alone as to draw off all show and perception of the disease from the part affected, and to appropriate them to itself. The physician could see no sign of disease in the heart and the patient had no feeling of it there. In show and in perception it was fixed in the nervous centres. The physician saw it and the patient felt it in the brain and in the spinal marrow and nowhere else. All was delirium and convulsion and nothing besides.

In the second case the sympathy of the nervous system was in the way not of action but of suffering. There was no convulsion, no delirium. The intellect was clear throughout and to the last. This suffering was in the part and not out of it, but so intense and so all-subduing as to suppress and keep down all the proper symptoms of the existing disease. For six weeks the malady consisted in short paroxysms of extreme pain and anguish belonging to the heart. And when the malady was consummated at length in one long paroxysm of three days, it too was all pain and anguish, still centred in the heart and still effectually hiding the inflammation, which had been progressive for weeks and had now reached its accomplishment in suppuration.

LECTURE XXVI.

DISEASES OF THE HEART'S MUSCULAR STRUCTURE CONTINUED. —CHRONIC INFLAMMATION TERMINATING IN ULCERATION.— IN PARTIAL DILATATION.— IN POSSIBLE RUPTURE. — ITS DIAGNOSIS UNATTAINED.—CASES.—THE SOFT HEART.—THE FAT HEART.—INQUIRY INTO THEIR CLINICAL DIAGNOSIS AND CLINICAL HISTORY.—RUPTURE OF THE FAT HEART.—CASES.

MORBID anatomy has disclosed to us other conditions of the heart's muscular structure with which we are familiar as results of inflammation in whatever part of the body they are found; such as circumscribed abscesses or deposits of pus; also ulcerations, some having their origin and progress from the pericardial surface inwards, and some from the endocardial surface outwards.

In the heart it has been sought to demonstrate by dissection the same forms of aneurism which affect the arteries. And to a great extent successfully. Now there is none of them which do not involve disease of its muscular structure, disease originating within itself or imparted to it from contiguous tissues. Sometimes the aneurism has presented an appearance as if the disease from which it resulted had belonged to the muscular structure entirely and exclusively. The endocardium and the pericardium have come together at the dilated part, and no muscular structure has been found intervening between them. It has been destroyed by disease, and is absolutely absorbed and gone. Sometimes it has seemed as if it had begun from inflammation at a spot of the endocardium, which had softened and destroyed the subjacent muscular layers and so, proceeding by intermixtures of pus and blood, had ended in rupture. This is an acute form of aneurism. Sometimes it has seemed as if it had begun by converting the muscular substance into a semilardaceous, semifibrous mass, and proceeded by gradually attenuating it and implicating the endocardium and pericardium with it; and so, by the impulse of the circulating blood, a pouch-like dilatation has arisen and perhaps ultimate rupture. This is a chronic form of aneurism.

But the subject of cardiac aneurisms, and of all the forms of disease which it embraces, is one of great pathological interest, and must be studied in the writings of those who have handled it with the care which it deserves.* It was necessary for me thus shortly to direct your attention to some of its prominent realities, before I could well proceed to consider the living phenomena connected with them.

Now our clinical acquaintance with these diseases during life has not kept pace with the knowledge which anatomical investigation has procured us of them after death. Sometimes they have had their beginning and their progress without awakening in the patient the least suspicion of anything wrong within the heart. He has had no consciousness of ailment or suffering, and the fatal consummation has been an awful surprise. Sometimes they have been attended with suffering enough to alarm the patient and by symptoms enough to enable the physician to infer damage of the heart, and even to anticipate its fatal event, but not to be sure of its nature; such as faltering and failure of the circulation and dyspnœa and anguish, either constant with occasional aggravations, or altogether occasional and in paroxysms, but, whether constant or occasional, never attended with any precise auscultatory signs.

But sometimes they have had the accompaniment withal of precise auscultatory signs, and these have gone to the clear diagnosis of certain present conditions of disorganisation within the heart. But then these conditions have been no essential part of *the* disease. Auscultation has told of hypertrophy and general dilatation of the ventricle with certainty enough, but it has left the partial aneurismal dilatation and the circumscribed progressive ulceration and the impending rupture entirely unsuspected.

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* M. Thurnam has pursued his researches into this subject with singular industry and ability. He has brought together from all quarters a multitude of interesting facts and displayed them and commented upon them in the best manner. Med.-Chir. Trans. vol. xxi. p. 187.

See an admirable summary of the same subject by Hasse in Dr. Swaine's translation of his Pathological Anatomy, lately published by the Sydenham Society, p. 140.

J. R. was not far short of seventy. For the two or three last years of his life I knew him well and saw him often, but never heard him complain of any infirmity. He was an accomplished scholar; convivial and more than habitually cheerful; he was even habitually joyous. This I mention to show the great probability that he really felt nothing of his fatally progressive disease. With such a constant complexion of mind surely he could not have been a constant sufferer.

On Saturday, the 7th May, 1831, he became alarmingly ill and I was called to visit him. I found him seated in his chair, his countenance blanched and full of anguish, his breathing hurried, his skin chilly, and his pulse very frequent and very feeble. He spoke in catches, now running on rapidly and now coming to a stop, as people do when they have not breath enough to carry them through what they have to say. He muttered something about sinking and fainting.

All this looked near akin to death. And my present business was to keep him from actually dying by any stimulus I could administer.

I collected this history of what he had been lately doing. It was the time of a general election; the general election which was to settle the fate of the Reform Bill, when all England was in an uproar. My friend had posted down to Northumberland, and then posted back to Cornwall, had been elected for a Cornish borough and then returned to London. He had only been in town a day or two. On the preceding day he had suffered severe diarrhœa and vomiting, and on that very morning the vomiting had returned.

With this history I conceived simple exhaustion was almost enough to account for what I saw. I had him put into a warm bed, and desired that warm gruel mixed with brandy should be given him pretty frequently, until I saw him again.

In an hour or two he was relieved in his general feelings. He had thrown off his death-like aspect. But still his respiration was fearfully hurried and his pulse very frequent and very feeble. And now in running my ear over his chest I heard a small crepitation at various parts of the lungs. It was upon the whole of great extent, and proceeding (as it seemed to do) from the lesser bronchial ramifications I looked upon it as the cause of the present dyspnœa. Accordingly I took it as my indication of present treatment and ventured to apply a few leeches. They drew but little blood and that very tardily, owing probably to the chilliness of the surface and the emptiness of the cutaneous vessels. Nevertheless he was relieved; and during the night a poultice was spread all over the front of his chest which obtained a little more blood from the leech-bites, and more relief. With this local treatment I was still upholding him with cordials and ammonia.

The next day, Sunday, I saw him several times. There was less about him to occasion alarm, but enough of hurry and impediment in his breathing to call for a large blister. This was applied to the chest and allowed to remain on twenty-four hours. It raised very little vesication but acted well as a rubefacient, and further relief followed.

On Monday this relief was apparent, and when my ear was now applied to the chest, it found the respiratory murmur passing through every part of both lungs unmixed with any unnatural sound except below the scapulæ. Here the crepitation remained. His skin was now constantly bedewed with a warm gentle perspiration. Every thing about him was promising except his pulse, which was still very frequent (much above 100) and extraordinarily feeble.

On Wednesday, having allowed him to leave his bed, I found him up and dressed and seated in his chair, reading Horace, and as joyous as ever, and intent upon going to the Eton dinner the next week. At this time he believed himself almost well, and indeed he looked so. Even his respiration no longer suffered impediment from the exertion of walking about the room. Still the feebleness of his pulse was extreme and its frequency was not at all reduced.

The two next days, Thursday and Friday, brought him in his own consciousness and to all appearance nearer and nearer to health. But his pulse was as weak and as frequent as ever. It had also something strange in its character which I cannot describe. In my examinations of the chest from time to time I had found the heart's impulse exceedingly feeble, yet perceptible in a larger space than natural; and it was feeble still. All this did (I confess) occasion me some apprehension, and I begged upon the plea of the peculiarity of his case, that he would allow me the benefit of consulting with some other physician, before I granted him the rights and privileges of health. Accordingly it was agreed that Dr. Maton should see him with me on Sunday or Monday.

On the morning of the next day, Saturday, I found him in bed, and was told that he had passed the night uncomfortably. He had himself however been quite unconscious of it at the time, but he was now sensible enough of a more hurried respiration. Yet to my ear the air passed freely and without unnatural sound through the entire lungs except the lower part of the right behind. Here there was crepitation, and here I put on a blister. I saw him again at 8 o'clock at night, when he was much more at ease in his chest. Three hours afterwards I was summoned to him on an alarm of his being worse. I went and found him dead.

The account given me was this. His attendants had been absent from his room a few minutes. On their return they found him with his body stretched towards a table by his bedside, lying motionless, and holding a cup of barley-water in his hand. They thought he had fainted and endeavoured to rally him, but without success. He was probably then dead, although, when I arrived an hour afterwards, they did not seem sure that he was so.

The body was examined after death. The cavity of each pleura contained about a pint and a half of clear serum, without a vestige of inflammation on the surface of the membrane. The lungs were pervious to air and crepitous at every part. Wherever they were divided, there followed a small quantity of frothy serum a little tinged with blood. At its posterior and lower part the right lung was somewhat denser and of a darker colour than elsewhere. But here too it was quite crepitous, only, where it was divided, a larger quantity of serum and more mucus mixed with blood followed than from other parts.

There was no unusual amount of fluid in the bag of the pericardium; but the membrane was unusually vascular. The heart was large, and at one part of its walls (a space of about two inches) constituting the left ventricle, it was pale and very soft and gave to the touch the notion of an abscess approaching the surface from within.

All its cavities were perhaps slightly increased in their capacity, but its lining membrane presented no visible trace of disease, save where and what will be mentioned presently. Its whole muscular structure was flabby, pale, and lacerable, a condition which seemed to arise from its partial conversion into fat. The fat in some parts occupied the place of the muscular fibres, the external layers especially; in other parts it was intermixed with them, now one and now the other being predominant.

That portion of the left ventricle already mentioned, which in its external aspect gave suspicion of an abscess, presented the following conditions of disease. There the heart was so attenuated as not to exceed the breadth of a half-crown piece, and rupture or ulceration preparatory to rupture was in progress. The internal lining was destroyed, and to the rough surface that it left a large irregular-shaped clot of blood was adherent. What remained exterior to the clot had lost all cognizable organisation; it hardly cohered together and was torn like wet paper.

The aorta throughout its course within the chest (for so far only it was examined) was dotted with little earthy and atheromatous deposits. The omentum was loaded with fat. The liver was twice the natural size and full of blood, apparently not diseased. Its red structure predominated.

This was a case of aneurismal or partial dilatation of the left ventricle, in which rupture was only just anticipated by death. The beginning and progress of the disease were undistinguished by any living phenomena. When it reached its consummation, then indeed symptoms arose, which were striking and prominent enough. But they had no diagnostic character. As to the nature of what was going on they told us absolutely nothing.

Let me give another case:—

H. T. was sixty-three years of age. He had passed a very laborious life, carrying on an extensive business as a general medical practitioner; yet he had had no experience of disease in his own person and had been singularly exempt from bodily infirmity until the autumn of 1844. It was then that he was suddenly seized with cholera. I attended him and for forty-eight hours thought him in great peril. Vomiting and diarrhœa, an enormous evacuation of fluid like water-gruel upwards and downwards, and severe abdominal pain and coldness and duskiness of the surface, and cramps of the lower extremities and a very feeble and frequent pulse sufficiently denoted the nature of the disease and its extreme danger. I treated him with calomel and opium to restore healthy secretion and subdue pain on the one hand, and with brandy-gruel to keep him alive on the other. In two days bile was again apparent in the evacuations and he was safe for the present.

Yet he did not pass at once into health, but lapsed into a state of fever. It was fever of low action and continued with increasing debility for more than a week; when it showed enough of an intermittent character to suggest the use of quinine. The remedy was true to its specific virtue. His rigor, heat, and perspiration never returned, and he was at once fairly on the way to health again. But he never actually regained the same perfection of health which he had enjoyed before. His family told me he was never again the same man. Yet to me his aspect bore no marks of change. If it had, I must have observed it. For I saw him at intervals ever afterwards as long as he lived, being in attendance upon a near relative who resided with him and was dying of a lingering disease. To his family however he complained that he was more easily fatigued than he was wont, and he spoke sometimes of uneasiness in the chest and palpitation. Yet he made no complaint to me. He was still bustling about in a carriage or on foot day and night.

I mention these circumstances because they are not irrelevant to the event. I saw him for the last time on Friday, Feb. 6, 1846. He was then (as I believed) in health. On Saturday, Feb. 7, at half-past 11 P.M. he was seized with illness, and on Monday, Feb. 9, at half-past 1 P.M. he died. I happened to be out of town at the time. All was done that could be done by Dr. Roots, who saw him during these last thirty-eight hours of his suffering and of his life. At the house of a patient, whom he went to visit late at night, he was attacked with vomiting and diarrhœa, and passed at once into a state so full of alarm that Dr. Roots was summoned to him. That physician has described to me that he found him apparently dying. He was removed to his own home. And still for the rest of that night and the whole of the next day and the next night he was apparently dying. He did not rally in the least degree. All the stimulants which were administered just kept the circulation moving and nothing more, until on the following day he breathed his last at half-past 1 P.M.

In this as in the former case the fatal attack began with vomiting and diarrhœa. The coincidence is worth notice.

The body was examined after death by Mr. Wormald, who has furnished me with the following description of what was found.

"On opening the chest, which was very capacious, the pericardium appeared full and tight. Although no great quantity of liquor pericardii was effused, yet, the heart being large and all its cavities gorged with blood, the membrane was greatly distended. White patches on the surface of the heart gave evidence of past inflammation, and its substance was of a brown tint and of a more flabby consistence than the other muscles of the body. The lining membrane was thickened especially about the base of the mitral valve, where there was a deposit of a yellow colour. The left ventricle was very capacious and its walls thicker than natural except at one circumscribed space. This was between the two large carneæ columnæ. Here, at the expense of the muscular substance which had entirely disappeared, a cavity was formed large enough to contain half a walnut. The thickened lining membrane was here united by lymph to the serous covering of the heart, and both together formed its external boundary. It was diaphanous, and served for the only barrier which prevented the blood flowing from the ventricle into the cavity of the pericardium. There was no laminated coagulum in the aneurismal pouch."

Mr. Wormald adds, "The liver was large and indurated, and the terminal branches of the vena cava hepatica were loaded with blood. There was moreover a slight rupture of the peritoneum covering the liver, which extended to one of the small hepatic ducts and to one of the branches of the vena portæ between the lobules. This served to account for some blood mixed with bile, which was found in the cavity of the abdomen."

Here as in the former case rupture was only just anticipated by death. And in both cases death probably arose from the physical impossibility of the heart's maintaining its power of contraction after it had suffered absolute loss and disconnection of its muscular substance, while its place was nevertheless supplied by other tissue.

This partial dilatation or proper aneurism of the heart, in which its muscular structure is especially implicated, is a form of disease by no means unfrequent, very interesting pathologically and always tending to a fatal event. My business has been to learn how far we have cognizance of it by living circumstances; whether it has any proper clinical history or clinical diagnosis. And not any such can I find.

But existence may continue until actual rupture take place and blood escape into the cavity of the pericardium. Death is then more instantaneous. I have seen some such cases, but I have not known them until their fatal event has already arrived. It is hardly necessary to record them for the sake of telling how this that and the other person fell down dead without any previous warning. It is not the manner of *death* that it is profitable to understand in this disease but the manner of *life;* how life and the great organ of life are affected by it at its beginning and during its progress, and what indications they show enabling us to minister to it remedially.

The two cases, which I have related, surely do not contain what we are in search of in respect of the particular disease. But they contain, nevertheless, matter for reflection. They convey, not a clear understanding, but some conceivable notion, how life itself and the very attributes and conditions of life in different organs may interfere to prevent that perfect knowledge of diseases, which we seek from their symptoms.

Take these two cases and compare them with the other two which were given in the course of the last lecture, and see what they appear severally to denote. The first are cases of acute inflammation in the heart's muscular structure running on at once to the formation of pus. They show a disease of such force and rapidity as by its overwhelming impression upon the vascular system and the nervous system to throw all sympathy into disorder, and utterly to confound the signs by which we could judge of its existence. The second are cases of chronic inflammation of the same structure proceeding by little and little with its destructive process of ulceration. They show a disease so tardy and so gradual as to convey no perception of what it is to the blood-vessels or to the nerves, and to awaken no sympathy in them, and call forth no signs from them of its existence. Its whole clinical history is comprised in its fatal event.

The rupture of the heart, which has just been spoken of as the last result of ulceration, may yet occur independent of it. Still wherever it has been found, there has generally been at the same time some peculiar condition of the muscular substance which might be presumed to favour it. It has been so soft and loose of texture that it could be pierced through with the weight of a probe. Or it has been converted into, or greatly intermixed with, fat.

Not that a rupture has not been found where the texture of the parts has seemed to offer no natural facilities to its occurrence, as in the case related by Harvey himself, who found a lacerated aperture in the left ventricle capable of admitting the finger through which blood had escaped into the pericardium, the walls of the ventricle being increased in thickness and strength, while an obstacle existed at the entrance of the aorta.* Here the heart must have torn itself asunder by the simple violence of its contraction in contending against the impediment to the egress of blood from its cavity. This is an effect which would hardly be thought capable of being thus produced. But I can well conceive it possible, having seen one of the recti muscles of the abdomen torn in twain in a man, who died of tetanus.

The two conditions of the heart's muscular tissue which have just been mentioned incidentally, deserve a more special notice. We have seen that rupture is sometimes found to take place for no other apparent reason than because the heart is soft or the heart is fat. This is a grave result and enough of itself to bespeak attention to whatever may conduce to it. But softening of the heart and its conversion into fat have other serious results to which they lead.

What is meant by softening is this, a loss of the natural firmness of the heart's muscular fibres and of their natural cohesion among themselves, whereby the organ becomes flaccid and yielding under slight pressure and is easily torn. Being separated from the body it is unable to maintain its natural shape. Instead of being round it collapses and becomes

* Harveii Exercit. altera.

flattened. In its extreme degree of softening it presents a loose, soddened, homogeneous mass, which has lost all trace of fibrous structure.

For the clinical diagnosis of the softened heart you cannot be referred to any sure signs either auscultatory or non-auscultatory. There are none such as *taken alone* would determine its existence. But there *are* such, as taken together with certain preparatory and conducive circumstances would make one almost sure of it; the circumstances, I mean, which constitute its clinical history. Now what are they? First there is fever. For many years I have been accustomed to consider no single symptom, arising at an advanced stage of fever, to be of more unfavourable import than an intermitting or irregular pulse. Though from his general condition I might have no such expectation, yet the state of the pulse alone had made me anticipate the patient's death.

In the fever which has prevailed during the last seven or eight years in the hospitals of London,* and which has been characterised by weakness rather than strength, and by petechial eruptions, the morbid appearances after death have been of various kinds and appertaining to various organs. Among other kinds there has been a remarkable softening of textures; and among other organs, such as the liver, the spleen, &c., this softening has frequently belonged to the heart. Now, whatever share a softened liver or a softened spleen may be thought to have in determining the fate of the patient, a softened heart may be well conceived to have a greater.

I have been looking over M. Louis's admirable book upon fever and find him laying great stress upon the intermitting and irregular pulse, attesting its formidable import, declaring how few who have it recover, and stating that he has found in almost all of those who have had it and have died, a softening of the heart's muscular structure.

Dr. Stokes of Dublin† has lately been directing attention to the same morbid condition of the heart among the formidable contingencies of fever. And he has done so, with some novelty in his views of the real nature of the thing itself, with a more precise notice of its diagnostic signs and (what is most

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* The *substance* of this lecture was given in 1839 and 1840.

† Dublin Medical Journal, March, 1839.

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important of all) with the discovery, that these contain indications which may be safely trusted to decide one of the most difficult points of practice in the management of fever. Dr. Stokes holds this softening of the heart to be a proper and special effect of fever, and its diagnostic signs to be the impulse of the ventricle becoming almost or altogether imperceptible, and the systolic sound at the same time almost or altogether inaudible. And he considers that the impulse and the sound together being thus weakened or abolished, whatever in other respects be the patient's condition, call at once for stimulants as his only means of safety: and that his safety is insured as soon as a fairly perceptible impulse and a fairly audible sound are thus restored to the heart. The impulse and the sound thus ceasing and thus returning are, under the circumstances, diagnostic signs as nearly perfect as can well be conceived.

But there are certain chronic constitutional diseases, in which the blood becomes corrupt in quality or deficient in some essential constituent, in its red globules for instance, as in scurvy or chlorotic anæmia. A pulse deficient in power and intermitting is among the characteristics of such diseases, and when death takes place, the heart is found softened.

I have something further to say practically upon this subject of the softened heart which must be reserved for another place.

That other condition of the heart, viz. the conversion of its muscular substance into fat, which acquires an importance from the serious results to which it leads, may be described in a few words.

The healthy heart is always more or less marked upon its surface with streaks of white, and this appearance comes from the deposition of fat in the cellular texture which unites the serous covering with the subjacent muscular structure. It is found chiefly where the venæ cavæ unite to form the right auricle: also at the base of the ventricles and along the line which marks the boundary between the two, and around the great blood-vessels as they emerge from the heart. But when fat is found in more than these situations and in more than the natural quantity, it is not so much added to the healthy substance of the heart as existing at its expense and detriment, and the muscular structure is that which especially suffers.

The muscular fibre is sometimes pale and wasted like that of a paralytic limb.

Now the predominance of fat in the heart, whether it be superadded to, or intermixed with, its muscular structure, may be said to constitute a form of unsoundness partaking, in some sort, of the character of disease; moreover, like other unsoundness from disease, it naturally leads to unsoundness from disorganisation. The fat heart ends by becoming also a dilated and enfeebled heart.

During the life of the patient, however, there is (as far as I know) no sure diagnosis of the fat heart, but a probable conjecture only. And even this probable conjecture can scarcely be made while the heart is *simply* fat, and nothing more, but must wait until it has reached that further disorganisation to which it naturally tends, namely, dilatation. But, when dilatation is ascertained by its appropriate signs, if valvular unsoundness, as its cause, be excluded by the absence of endocardial murmur, and if a feeble fluttering movement of the heart be felt at every part of the præcordial region, or beyond it; and if, moreover, the constitutional habit of the man be such as to accumulate fat in all other parts, then it may be taken almost for certain that fat is especially deposited upon the heart at the expense or detriment of its muscular substance. Be it always remembered, nevertheless, that our inference, however correct it may turn out, is drawn, not directly from any express diagnostic signs, but indirectly from coincident circumstances. No murmur reaches the ear to tell us at once that the heart is fat. But we know that the heart is feebler and more capacious than natural. And we know that such, if life last long enough, is ultimately the condition of all fat hearts. Besides, we observe that the patient is *altogether* fat, and so we infer the probability that the heart has not escaped his constitutional peculiarity.

I purposely dwell upon these points. For one principal object I have in view is to bring diseases of the heart to a living test; to stand by the bed-side, and there see how much we *know* of them, and how much we *conjecture*, and how, according to degrees of probability, our conjecture is made, sometimes little less than *knowledge*, and sometimes little more than *a guess*. Now we are able during life to conjecture a fat heart with such strength of probability that we almost know it.

It has been said, that from being fat the heart becomes dilated. This is its natural tendency, and, if life last long enough, the event is inevitable. For the present, however, we will not inquire further in this direction. But there is another event which is of much rarer occurrence, and may interrupt its progress to that which is more common. This is its rupture.

My own knowledge of rupture of the heart is limited to a single case. I have, indeed, seen many a specimen of its morbid anatomy; but this is a different thing from knowing cases. And I have seen some few brought into the hospital dead or dying, in whom, after death, the heart was found ruptured; but this, too, is a different thing from knowing cases. Only in a single instance have I ever witnessed the living circumstances attendant upon a rupture of the heart, and watched the mode and process of dissolution from it. And in that instance the disease of fatness (so to speak) preceded the rupture. To me it was full of instruction, and may be so to others: therefore I will relate it at large:—

R. B. was in his sixty-first year. For several years he had been crippled by the effects of gout. He wheeled himself from room to room in an invalid's chair, and could walk only by the help of crutches. He had never been intemperate, and was now abstemious: yet his sedentary life had made him fat.

I had known him for more than three years. My first acquaintance with him was while he was suffering one of the severest fits of gout he had ever experienced. From that time forth he put himself under my professional care. I visited him occasionally, and did my best to ward off the attacks, to mitigate them when they came, and to make life tolerable under his great infirmities. In truth, after I knew him, his fits of gout were much less frequent and much less severe than they had been before.

One day I was called to visit him in consequence of an unusual pain he had been suffering. It occupied the entire front of the chest, and passed along both the clavicles to the top of the shoulders and there ceased, without descending down the arms. It was constant. It had already endured for a day or two, and had become much greater during the last night. His family, who had watched him, and knew how naturally uncomplaining and patient he was, had already taken alarm from something in his looks, which told them that he felt more than he expressed. His pulse was neither more nor less frequent than natural. It was hard and incompressible; but such was its ordinary character. His bowels were more torpid than usual. Not clearly seeing the nature of the present distress, I contented myself with ordering a mustard poultice to the chest, and prescribing some cordial aperient medicine.

On the next day I found that not the smallest relief of pain had been obtained. And now he described more distinctly its severity, which had kept him sleepless and incapable of lying down during the entire night. I examined his chest. The lungs admitted air freely and equably. The respiratory murmur was perfect. The heart beat over a somewhat larger space, and with somewhat more force than natural, but without unnatural sound. He looked more subdued than on the preceding day. But no new symptom had arisen. His complaint was still of pain, and of pain only. It looked like *angina pectoris* but for its permanence. With some slight hope that it might have a relation to his gouty habit, I ordered half a drachm of vinum colchici and a drachm of paregoric to be taken immediately, and again in six hours.

To my great surprise, on the following day I found him quite free from pain. He had taken the first dose of colchicum and paregoric, and then the pain began gradually to leave him. He took the second at bed-time, and passed a comfortable night. The medicine had acted upon no secretion. It seemed to have produced no sensible effect beyond the suspense of the pain, if that really was its effect; only it had left a slight nausea. Conditionally, in the event of the nausea first passing away, I directed him to take the same dose of colchicum and paregoric at night. The nausea did cease, and the remedy was taken. The next day he cheerfully reported that he had passed a good night, and had been and still was free from pain. But the nausea had returned. This state of things admonished me to desist from medicine altogether. The nausea prohibited the further use of colchicum, and the total absence of pain left nothing to be done at present but to wait and to watch.

Together with the events of this important case, let us have regard to the article of *time*. It was Monday when I first saw the patient, and now it was Thursday. Already, for two nights and for a part of two days, the pain had been suspended, and it was about to be suspended for a night and a day longer; a circumstance which in the sequel will appear quite unaccountable.

Well; his state was now so hopeful that my attendance on the following day seemed unnecessary. And, enjoining a total abstinence from medicine in the meanwhile, I appointed to visit him again on Saturday.

But on the next day, Friday, I was suddenly called to him. It was six P.M. I found that, about an hour before, the pain had returned with far greater severity than ever. He was deadly pale, and from the centre to the extremities of his body he was cold as marble, and streaming with perspiration; but his pulse was of a good strength, and his heart was contracting regularly and forcibly, and now, for the first time (according to my observation), with a loud systolic murmur, audible in the præcordial region, and not in the arteries. I administered a large dose of opium with æther and ammonia. Visiting him again in an hour or two, I found the pain unabated, and his pulse beginning to sink. I staid with him through the night, still giving at intervals opium and æther and ammonia, and applying external warmth, but all to no purpose. Still the pain did not lessen. Still he looked and he felt like a corpse, he was so pale and so cold. At four in the morning (Saturday) the pulse finally ceased to be felt in the arteries, while yet the heart was perceived by the ear to move, but not by the hand. In this state he survived seven hours longer, until, with his mind clear to the last, he died at 11 A.M. Let me add, what I shall not soon forget, that this good man endured eighteen hours of mortal agony with wonderful patience and resignation.

Upon examination after death, all the interior structures of the body were found more loaded with fat than its external appearance would have led me to expect. We looked only superficially to the abdomen, where we found nothing remarkable but a vast accumulation of fat within the mesentery. Our attention was chiefly directed to the suspected seat of disease—the chest. Here the lungs were perfectly healthy. The heart was a good deal larger than natural as a whole, and incased in fat. It was upon its right side that the fat was accumulated to the greatest amount, and its muscular substance was everywhere very flaccid and very thin, and became thinner and thinner as you approached the apex, where it was reduced to a mere line. Yet, thin as it was, it was quite healthy in colour, and preserved all the visible characters of muscle without any intermixture of fat. The fat was all exterior to it. The capacity of the right ventricle was notably larger than natural. Its internal lining was stained of a deep red. Its orifices were free, and its valves healthy. On its left side it was less covered with fat. Here the ventricle was considerably dilated. The muscular substance was considerably hypertrophied. It preserved its healthy character, both of colour and consistence in the external parietes; but in the septum it was pale and soft, manifestly in consequence of fatty degeneration. In the septum, at its posterior juncture with the parietes, there was an oblique rent passing through it from ventricle to ventricle. On the side of the left ventricle it was an inch and a half in length; on the side of the right it just opened at a point. In truth, while we were examining the right side, the rupture passed undiscovered. The orifices of the left, as of the right ventricle, were quite free, and its valves healthy. The coronary arteries contained some atheromatous deposits, but were quite pervious. The aorta was healthy as far as its arch. It began to be studded with atheromatous and earthy matter in its descending portion.

When this case occurred to me, it brought to my recollection a specimen of rupture of the septum preserved in the museum of St. Bartholomew's. The patient from whom it was taken did not die in the hospital. I did not see him; but I took some pains at the time to ascertain the circumstances of his death from those who witnessed them, as well as those circumstances of his life which could be fairly ascribed to the state of his heart found upon dissection; and the following is the record which I then made:—

A gentleman, sixty years of age, inclining to corpulence, had for several years been liable to occasional attacks of severe inflammation of the lungs, requiring copious blood-letting for their cure. In the month of February, 1829, having suffered such an attack during the previous winter, and been relieved in the usual manner, he began to experience a new complaint. This consisted of pain beneath the sternum, suddenly coming and going, attended by pain or numbness down one and sometimes down both arms, and by something more than pain, an indescribable anguish, generally within the chest. The attack would seize him as he walked along the streets; whereupon he would stop, turn into a shop, rest a while, and then proceed. The weather was foggy at the time, and to it he was willing to ascribe his new complaint. But the attacks continued to recur when there was no foggy weather to account for them. In the month of April he suffered two; one on horseback, the other in bed and at night.

One day, towards the end of the same month, he was suddenly seized with this pain beneath the sternum and down both arms. It was severe and agonizing, beyond what it had ever been before: and immediately his aspect became that of a dying man, pale and purple about the lips; his pulse very frequent, and hardly perceptible. In this condition, by the help of stimulants, he was still kept alive three days.

The state of the heart, as it was found after death, is thus described in the catalogue of the museum: "The cavity of the right auricle is larger than natural, and its membranous lining is thick and opaque. The tricuspid valve is thickened, and its lining opaque. The aortic valves are a little thickened, and there is a soft matter deposited beneath the lining of the aorta just above the valves. The coronary arteries are thickened, and there is bony matter deposited between their coats. A rupture of the septum dividing the ventricles has taken place near its union with the posterior wall of the heart, by which a free communication is made between the two ventricles. On the side of the left ventricle the opening is about two inches in length, and of a semi-lunar form. On the side of the right the opening is much smaller and rounded."

From the description which I have quoted, it does not appear that the septum had undergone any morbid degeneration, which could be thought to give it a greater liability to rupture than any other part of the heart's muscular structure. But such degeneration was so remarkable in the case which had fallen under my own observation, that I could not help desiring a more accurate examination of the preparation at St. Bartholomew's, if after the lapse of seventeen years it were indeed possible. Mr. Paget and Dr. Ormerod undertook it for me, with the aid of the microscope, and have obligingly communicated to me what they were able to make out: "There was much oil swimming at the top of the jar. The texture of the heart was somewhat soft. On the parts about the rupture were many drops of oil, and hereabout the muscular tissue was evidently disorganised, for it appeared as irregular granular cords, without any transverse striæ, which elsewhere were well-marked. But there was no distinct fatty degeneration of the muscular fibres."

It appears then that in this, as in the other case, the septum had undergone a morbid change of structure, rendering it more liable to suffer rupture. But the change was not exactly of the same kind in the two cases.

LECTURE XXVII.

UNSOUNDNESS OF THE HEART FROM DISORGANISATION.—HYPERTROPHY.—ATROPHY.—DILATATION.—CONTRACTION.—WHAT THEY ARE IN THEMSELVES, AND IN THEIR COMBINATIONS.—THEIR CLINICAL DIAGNOSIS.—HOW FAR ATTAINABLE BY AUSCULTATION.—THEIR CLINICAL HISTORY CONTAINED IN PRIOR DISEASES CONDUCIVE TO THEM.—THESE DISEASES MAY BE EITHER IN THE HEART OR IN OTHER PARTS OF THE BODY.—OBSERVATIONS UPON THEIR CLINICAL HISTORY, AS CONTAINED IN PRIOR DISEASES OF THE HEART.

WE come now to those affections of the heart which may be usefully classed together under the name of unsoundness from disorganisation. They consist in alterations of size and shape and bulk and capacity, and are the same which are commonly denoted by the terms hypertrophy, atrophy, dilatation, and contraction. And I shall continue to use the same terms. I only designate them, *as a class*, by this name of "unsoundness from disorganisation," that it may help us to keep in mind the important truth, that disease properly so called does not enter into the actual process of their formation.

Disease or any unsoundness left by disease within the heart may indeed furnish their original and conducing cause. But the things themselves are still different. Adhesion of the pericardium and thickened valves and strictured orifices may be first the spring and then the motive, the never-ceasing and often the ever-increasing motive, of the heart's contracted or dilated cavities, of atrophy or hypertrophy of its muscular substance. And thus in the end nothing is more common than for the same heart to present a complex of unsoundness from disease, and of unsoundness from disorganisation. Still (I repeat) the things themselves are different. And their very relation to each other, and their frequent union in the same subject make it the more necessary to remember that they are so.

It was but fit, however, that in the order of our proceeding we should preserve the link of connection which pathology has pointed out between the two; and treat of that first which naturally comes first, and then of that which naturally follows. So much for the sake of arrangement. But now, when we are come to these latter affections, to these forms of unsoundness from disorganisation, you will find that it is with them as it is with every thing in the shape of disease or disorganisation throughout the body, viz. that while each according to its kind has one mode or process of formation which is peculiarly its own, it may have twenty different causes capable of originating it and conducing to it. Thus there is one process of hypertrophy and one of atrophy, one process of dilatation and one of contraction of the heart's cavities in all cases. But the cause may be prior disease of the heart itself in one case, of the aorta in another, of the lungs in a third, deformity of the chest in a fourth, and the morbid quality of the blood in a fifth.

Hypertrophy and atrophy, dilatation and contraction, seem to carry with them their own meaning. What they are might almost be left to your general conceptions. Still some short description is needed to bring the things themselves fairly before the mind, ere we proceed to give a practical commentary upon them, and to dwell upon them more at large.

Hypertrophy is a simple augmentation, and atrophy is a simple diminution of bulk and consistence in the heart's muscular substance. In hypertrophy its muscular substance is more red than natural, its carneæ columnæ are increased in thickness, and its proper fibrous texture is every where more strikingly manifest, while there is no interstitial deposition of matter new in its kind. In atrophy its muscular substance is less red than natural, its carneæ columnæ less developed, and its proper fibrous texture less distinguishable. But there is still the appearance of muscle shrunk and withered as if from an insufficient supply of nourishment.

Of dilatation and contraction really nothing more can be said by way of description than that the one consists simply in increased capacity, and the other simply in diminished capacity of one or more cavities of the heart.

But these forms of disorganisation affecting the muscular substance and the cavities of the heart bear relations to one another, which should be noticed. Hypertrophy and atrophy seldom occur while the cavities retain their natural capacity. And dilatation at least, if not contraction, is seldom found without augmentation or diminution of bulk in the muscular parietes.

Upon this subject, of the capacity of the heart's cavities and the bulk of its muscular substance and the relation which one bears to the other, some explanation is needed to prevent erroneous notions from the language often employed. *Simple* dilatation is indeed often spoken of, implying augmented capacity of the cavities, while the muscular parietes still retain their natural thickness. Now consider, and you will see that the heart in a state of dilatation cannot preserve its normal thickness on any other terms than these, viz. that in exact proportion to its expansion and while that expansion is going on, something should be continually added to the bulk and substance of its muscular fibres. Hence what appears to be and is often called *simple* dilatation, is in fact and ought to be called dilatation with proportionate hypertrophy. And what appears to be and is often called dilatation with *moderate* hypertrophy, is in fact and should be considered dilatation with *excessive* hypertrophy.

Again consider, and you will see that the heart when its cavities are dilated and its walls thinner than natural need not on that account be considered in a state of atrophy. Here there has been a lengthening and expansion of the muscular fibres, but no diminution of their substance. In obedience to a pressure from within they have yielded and spread themselves over a larger space. They have lost nothing. They have suffered no atrophy: only they have not, as in the former case, experienced a proportionate hypertrophy. They have not, in proportion as they have lengthened and expanded, received additions to their bulk.

But at the bed-side we must be content to know less than we know anatomically, and to use terms which designate just what we know and no more. Practically and in relation to living circumstances the terms commonly employed, when I was a student, to denote these complex disorganisations involving the cavities and muscular structure of the heart, were very good. They regarded the ventricles more especially. The terms were active and passive dilatation.

They do not reach anatomical differences, but they vouch for as much as our diagnosis can really compass during the life of the patient. Active dilatation implies a more capacious ventricle with such a change of its muscular structure as is calculated to augment its power; whether this change be a non-apparent but real (what I have called a proportionate) hypertrophy, or an apparent and so an excessive hypertrophy. Passive dilatation implies a more capacious ventricle with such a change of its muscular structure as is calculated to diminish its power; whether this change be a real atrophy or an expansion and elongation only of its muscular fibre.

Active dilatation may appertain to every cavity of the heart simultaneously; and so may passive dilatation. But such occurrences are rare; for one cavity being naturally more liable to this species of dilatation and another to that, it most frequently happens that specimens of both conditions are found in the different cavities of the same heart.

Contraction of the heart's cavities is a much rarer pathological change than their dilatation; and when it occurs, it has hypertrophy or atrophy as less certain accompaniments.

A few years ago pathological anatomy had come to regard two particular forms of disorganisation as the natural opposites of each other, and was fond of using names chosen on purpose to mark their contrast. These names were—eccentric hypertrophy, and concentric hypertrophy. The eccentric was that in which the cavity goes on expanding and enlarging; and the concentric that in which it goes on closing and diminishing, as the muscular substance becomes thicker and thicker.

But it turns out to be more than doubtful whether this last combination have a real existence during life and whether it do not arise during the act of dissolution and result from the very mode of dying; in fact whether *concentrically* hypertrophied hearts be not hearts, which "being more or less hypertrophied, death has surprised in all the energy of contraction." This combination of thickened walls and diminished cavities has been found in those who have died violent deaths and in executed criminals. Dr. Budd met with it in many instances of sudden death from cholera. After maceration the cavity of the ventricle, which before would not contain a blanched almond, became of its natural capacity.*

Still there is no doubt that during life the cavities of the heart suffer diminution of their natural capacity. There are peculiar forms of preceding unsoundness *from disease* which lead to peculiar forms of subsequent unsoundness from *disorganisation*. They produce contraction of one cavity and dilatation of another, or of all the rest. Thus the left ventricle being diminished in capacity, the left auricle is enlarged; and sometimes not the left auricle only but the right auricle and ventricle also; nay more, some or all the blood-vessels leading immediately to and from the heart may be at the same time dilated except the aorta, which is contracted. Stricture of the mitral orifice is calculated to produce it all. Unsoundness of the mitral valve from disease may lead to this vast amount of unsoundness from disorganisation.

Of the forms of unsoundness from disorganisation described by morbid anatomy those which I have noticed are the principal in their kind. They are also the most frequent. They embrace moreover the pathological consequences of all the rest, and therefore may stand representatively and virtually for them all; and so be taken for the text of our practical commentary.

First then for their clinical diagnosis. This is chiefly an affair of auscultation. In our first lecture after describing the natural sounds, impulses and resonances of the heart, we considered their variations of degree and extent. And then we enquired what it was that such variations whether of excess or defect, according as they are differently combined in individual cases, must be taken to denote; and we found in them the express auscultatory signs of these forms of disorganisation which have just been described, namely, dilatation or contraction of the heart's cavities and thickening or attenuation of its muscular structure. I refer you back to what was then said instead of repeating it in this place.

It must be admitted however, upon this matter of the capacity of the heart's cavities and the bulk of its muscular substance, that accuracy of diagnosis is attainable only in respect of the ventricles. Of the auricles auscultation (as far as I know) conveys no direct intelligence. What their state may be we are left to conjecture from other and indirect signs, and chiefly from the previously ascertained state of the ventricles. And of the ventricles themselves, when the question is of their capacity and their bulk, the left is far more within the reach of accurate diagnosis than the right. And this more accurate diagnosis of the left may come from auscultation alone, while the less accurate diagnosis of the right comes partly from direct auscultation of it, and partly from certain conditions of the venous circulation and from the previously ascertained state of the left.

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* Edin. Med. Chir. Trans. xi. 296.

We come next to the clinical history of these same disorganisations of the heart, of its hypertrophy and atrophy, its dilatation and contraction. By clinical history here as elsewhere I mean the assemblage of living phenomena which experience has found to be prior and preparatory and conducive to them.

Truly it is a vast subject this of the clinical history of the disorganisations in question; and truly it must be a vast experience which embraces it, and peculiar difficulties lie naturally in the way of it. And it is well you should be antecedently aware of all this, that you may be better able to exercise a cautious judgment upon what can only be laid before you summarily and concisely.

Always then keep in mind the great difference there is between acute diseases and chronic disorganisations of the heart as to the way in which we come at our knowledge of the conditions conducive to each respectively. How much further will each man's own observation go in the one instance than in the other! By the time he has seen a few cases of endocarditis and pericarditis, he has an experience of his own of all the reputed conditions out of which they arise. The cases themselves have been entire cases. He has watched them from first to last. Their conditions have been such as strike the senses and emerge rapidly; and he has seen them as they have emerged. But he may have gone on witnessing cases of hypertrophy and atrophy, of dilatation and contraction half his life, and still found that his own experience has not yet certified to him all the reputed conditions conducive to them. Few, perhaps none, of the cases which he has witnessed have been

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entire cases. And observation runs sadly to waste when it is made upon cases piecemeal.

Again consider, when we have to deal with what comes first or comes early in a series of pathological changes, as endocarditis and pericarditis usually do, that then we have seldom far to seek for the conditions that lead to it. The few steps of our inquiry are tolerably easy and sure. We have perhaps only to examine the circumstances attending the last transition from health to sickness that took place some two or three days or two or three weeks ago, and there we find them. But when we have to deal with what comes last or comes late in a series of pathological changes, as hypertrophy and atrophy, dilatation and contraction usually do, then it must be by a more far-seeking, by a more difficult, and a more fallible research that we are to make out the conditions that lead to it. It will not be enough to note some recent transition from health to disease, but (what is a far harder task) we must make good the links which have been coupling disease with disease and disorganisation with disorganisation for years and years together.

In seeking to make out the clinical history of these affections we must be content with a mixed inquiry, practical in part and pathological in part, made up of our own experience and of others' experience, and of what we know or believe, from the nature of the thing, either must be or is likely to be.

Hypertrophy and atrophy of the heart, dilatation and contraction of its cavities seldom, perhaps never, take place but where some disease or unsoundness has previously existed, either in the heart itself or in other parts of the body, from which they are derived as a natural and necessary consequence. I say perhaps never, because the instances are very few in which such disease or unsoundness is not either already known during life or discovered after death: and in those very few where it is not apparent either during life or after death, the probability is greater that we had not penetration enough to find it out than that it did not exist.

Now, such being the case, they can hardly be said to have any clinical history which is properly their own. It must be greatly involved in the clinical history, whatever it may be, of any prior disease or unsoundness within the heart or without it from which they are derived. Hence all that has been said of each and every disease of the heart which we have hitherto described, of endocarditis and pericarditis and the permanent unsoundness which they leave behind, of thickenings and transformations of the valves and stricture of the orifices, also of inflammation and softening and degeneration of the muscular substance, what was it but a long recital of the conditions prior, preparatory or conducive to these forms of disorganisation which we are now considering? Thus a large part of their clinical history has been amply set forth already, although it was not specified as such at the time. But a large part remains to be considered, viz. that which is found in prior disease or unsoundness of other parts.

For the sake, however, of marking some important practical considerations, I wish to revert shortly to the connexion between prior forms of disease or of unsoundness from disease in the heart itself, and its subsequent forms of unsoundness from disorganisation. The clinical history of the second is contained within the first, which has been pathologically conducive to them.

Now, such clinical history of disorganisations of the heart may, according to the nature of its prior diseases, be plain and manifest and most instructive, furnishing a living illustration of their pathology; or it may be obscure and uncertain, revealing little or nothing of their pathology during life and leaving it to be made out by what may happen to be detected after death. Take a survey of cases and see how they bear out this view of the matter.

In many cases of hypertrophy or atrophy, dilatation or contraction, we are apt to learn, upon inquiry, that there was long ago an attack of acute rheumatism and that then the heart suffered detriment and from that time forth it had never been right. Furnished with this notable fact and knowing the heart's present condition we are enabled to read the cases backwards from their end to their beginning and see through all their course both clinically and pathologically. We now find hypertrophy or atrophy of the heart's muscular substance and dilatation or contraction of one or other of its ventricles. But before these there was adhesion of its pericardium or stricture of one or other of its orifices; and one or both of them still remain. And still before these there was inflammation of the pericardium or inflammation of the endocardium or of both, and the effects of one or of both were imperfectly repaired. And still, even before the inflammation or coincident with it, there was a rheumatic fever. It may have taken one or two, five or ten, fifteen or twenty years to bring results to their final accomplishment in different cases. But where there is so notable a fact to begin with and so clear a succession and development of pathological consequences from first to last, the matter might be simplified and the truth would be preserved and our conception of it assisted, if the whole were looked upon as one continued malady.

There are no cases belonging to the same class which have their clinical and pathological history so satisfactorily made out as these. Other cases, in which prior disease of the heart and its unrepaired effects are summed up in these same forms of unsoundness from disorganisation, give comparatively obscure tokens of their origin and progress. We find in them no notable fact which came first, and was manifestly exordial to all that followed. And the want of it spoils the completeness of their clinical history.

Call to mind what has been said of chronic diseases of the endocardium, producing cartilaginous, atheromatous and earthy deposits. How uncertain and conjectural were our notions of any living conditions preceding, preparatory and conducive to them. There is large experience of these forms of unsoundness from chronic disease co-existing together with the forms of unsoundness from disorganisation, which we are now considering. And whenever this is the case, we venture to conclude that the conversion of the valves into cartilage, atheroma or bone came first, and that the hypertrophy or atrophy, the dilatation or contraction followed. Pathological reasoning tells us that it must be so; although living conditions do not mark the time at which one is superadded to the other.

Call to mind too what has been said of the aneurismal heart and of the fat heart, and how obscure was their clinical history. Obscure also must needs be the clinical history of the hypertrophied or attenuated and dilated heart when they follow them as their natural consequences.

But something yet remains to be mentioned which, having a prior existence in the heart, may and does lead to its disorganisation; something, which has not strictly the nature of disease, although disease may follow it, and which I have not yet found a fit place for describing. I mean accidental injury.

I wish then now to direct attention to (what I will venture to call) shocks of the heart, in which it suffers hurt from violence. From this hurt or from disease which follows it, or from both, disorganisation, especially in the form of hypertrophy and dilatation, is apt to follow. Thus these shocks of the heart become part of the clinical history of its disorganisation and claim to be considered in this place. The subject (as far as I know) has nowhere been treated of. My own acquaintance with it is scanty and imperfect, but still enough to show me that it has very important relations, both pathological and practical. Being however of a distinct nature it had better be reserved for a separate consideration in another lecture.

LECTURE XXVIII.

UNSOUNDNESS OF THE HEART FROM DISORGANISATION SOMETIMES TRACEABLE TO AN ACCIDENTAL SHOCK WHICH IT HAS SUSTAINED.—THIS SHOCK A PART OF THE CLINICAL HISTORY OF ITS UNSOUNDNESS.

ACCIDENTS sometimes help to illustrate the operations and effects of disease as poisons illustrate the operations and effects of remedies.

The following case was furnished to me by Dr. Bence Jones:—

"A stableman twenty-eight years of age was admitted into St. George's Hospital. He was suffering, and had suffered for twelve months, severe palpitation of the heart, and was able to mark distinctly the moment of its commencement. It was one day just after running a horse down the yard to show off his paces to a purchaser. He had never had acute rheumatism. His lips were blue, his breath short, and his left side painful. He had a dry cough. His bowels were confined and his urine free. It was ten weeks before his admission that his cough and dyspnœa had begun to be particularly distressing. Auscultation found dulness in the præcordial region over an extent of four inches square, the heart's impulse increased and its first sound prolonged with a low blowing (endocardial) murmur over the aortic valves, and its second sound indistinct. He was bled three times under the urgency of his cough and dyspnœa. These however continued to increase. Five weeks after his admission his legs became œdematous, and in two weeks more he died.

"On examination after death three pints of fluid were found in the right pleura, and the heart enormously large. In length it reached from the second to the eighth rib, and across the base of the ventricles it measured six inches. The left ventricle was moderately hypertrophied and very largely dilated. The mitral valve was healthy, and the aortic was slightly thickened, and moreover had suffered rupture of a peculiar kind. One of its septa was torn away from its attachments, and thus two of its pouches were reduced to a single irregular one. The right ventricle was dilated, but both the auricles preserved their natural state. In the ascending aorta and in its arch there were atheromatous deposits. The liver was very large, and the spleen and the kidneys were healthy."

Cases running parallel with this are not common, but yet frequent enough for most medical men of experience to have met with one or two. Upon some violent effort, such as rowing, leaping or boxing, or some violent succussion by an external force, a shock is felt by the heart as of an injury done to it; pain, palpitation, and perhaps a sense of approaching death may follow. But death does not then actually take place. And the ultimate result is a good deal according to the treatment which the patient meets with at the time.

I have seen such accidents with such immediate effects terminate in simple palpitation or excess of impulse. This simple palpitation has been constant for a few months, and then it has been occasional only upon some known excitement, and then it has ceased altogether. Or it has been permanent and has never afterwards ceased, and then in process of time there have arisen moreover the sure signs of hypertrophy and dilatation. Again I have seen such accidents terminate in palpitation with an endocardial murmur, and both have been permanent, and in process of time the sure signs of hypertrophy and dilatation have been superadded to them.

After we have been engaged for some years in the practice of our profession we come to have a great experience in *fragments* of cases. We see abundance of cases at their commencement or in their progress, of which we never witness the termination. But such experience is not without value. All I know of the results which follow sudden shocks proceeding from accident and severely felt and resented by the heart, such as simple palpitation and palpitation with an endocardial murmur, palpitation enduring for a time and then ceasing altogether, palpitation abiding permanently and after a while having hypertrophy and dilatation added to it, all this has (I confess) come to me as yet chiefly from *fragments* of cases; cases, of which I have not seen the whole or witnessed the event.

But a single entire case often furnishes the key to many *fragments* of cases. Thus Dr. Bence Jones's case serves to explain others which have not run on to the like fatal result.

I was called to see a gentleman in the prime of life and having the aspect of perfect health, whose heart was beating with excessive impulse and with a loud systolic endocardial murmur, audible in the præcordial region, but not in the arteries. He was not incapacitated for moderate exertion, but found it needful to be very cautious what he did and how he moved, lest his palpitation should run on to a painful degree. I satisfied myself that the left ventricle had undergone a certain amount of hypertrophy, and that the mitral valve was unsound. But how came this serious detriment of the heart in one so young and otherwise so healthy? Had he suffered an acute rheumatism? No. Had he suffered any attack of fever or inflammation in which his heart was known to have been involved? No. But he had suffered *an accident*. A twelvemonth or more ago he had experienced (what I have called) a shock of the heart in rowing. A perilous state of things immediately ensued. He at once sought the advice of Dr. Chambers, who treated him according to the kind and severity of his symptoms, which were those of acute inflammation, of endocarditis. He bled him and brought him under the influence of other antiphlogistic remedies, and so saved his life. But he did not procure a perfect reparation. Permanent unsoundness was left behind; unsoundness of a valve, which though it proceeded from accident was tantamount to unsoundness from disease, and like it was ready to produce unsoundness from disorganisation. In truth now after the lapse of a twelvemonth it had produced hypertrophy of the left ventricle.

If in this case we inquire the nature of the injury suffered by the heart at the time of its first shock, Dr. Jones's more complete case must supply the key to it. And thus we cannot avoid believing that it was a rupture of the mitral valve.

Two more years have past since this gentleman was examined by me. I know that he still lives and bears the appearance of health, but still displays the same symptoms referable to the heart, and suffers the drawbacks upon his freedom of bodily exertion, which belong to unsoundness of the mitral valve and hypertrophy and dilatation of the left ventricle, but all moderate in degree.

It is pretty plain, in what point of view these shocks of the heart, attended with present structural injury, should be practically regarded. Any structural injury, inflicted by violence, forthwith has disease appendant to it. And, if it be of an external part and within our reach, we can both treat the injury and treat the disease, the one by our manipulations, the other by our remedies. But if it be of an internal part and beyond our reach, we can only treat the appendant disease. The rupture of a valve by shock of the heart forthwith has inflammation appendant to it. Yet we can only treat the inflammation and must leave the rupture to itself. Thus, respective to their treatment these shocks of the heart are to be regarded in the light of disease.

Not less are they to be so regarded, respective to their results. Our treatment, though it be only addressed to the appendant inflammation, may be followed by the perfect reparation both of the inflammation and the injury: or our treatment may save life, but fall short of effecting a complete reparation, and permanent unsoundness may remain. How much this unsoundness is made up of the half-repaired injury and how much of the half-repaired inflammation we cannot tell. But in process of time hypertrophy or atrophy, dilatation or contraction are added; and thus these cases, though they originated in accident, at last fall practically into the category of unsoundness from disease leading to unsoundness from disorganisation.

Now the cases, in which a present hypertrophy or atrophy, a dilatation or contraction are clearly traceable back to *a shock* of the heart, though they are not frequent cases upon the whole, are peculiarly interesting. And those, to which reference has just been made, may be taken to represent the most interesting of their kind, for they seem to display very intelligibly the manner in which events come to pass. The original *shock* of the heart involved an injury of one of its organic textures and the rupture of a valve: and the effects of that injury or of its appendant inflammation or of both, being incompletely repaired, became the manifest cause conducive to its disorganisation.

But there are cases in which we have the present disorganisation of the heart and the prior *shock* of the heart, yet we do not clearly see the intermediate agency by which the one has been brought out of the other; we have no sure evidence that the *shock* was attended at the time by any real injury of its organic textures.

Something, nevertheless, must have then occurred to make the heart palpitate ever afterwards and ultimately lead to its organic unsoundness. But what could it be? Can no other textures of the heart suffer mechanical injury and even rupture except its lining membrane and valves? It is mainly the muscular structure which is involved in the change of bulk and change of capacity constituting the eventual unsoundness. May it not be the muscular structure which suffers the primary injury? Indeed it may be, and it probably is; but the fact is utterly incapable of proof. Enough has been said in the two last lectures to show how strangely covert and secret and beyond the reach of clinical observation are all the chief diseases and injuries which primarily affect the muscular structure. It may suffer acute inflammation and purulent deposits among its fibres; it may suffer chronic inflammation and penetrating ulceration; it may suffer a complete disruption of large extent, and yet put forth no distinctive signs of one or the other during life. That the heart's muscular structure is penetrated with pus in one case, ulcerated through in another, and rent in twain in a third, are facts which are left for death to disclose. And, if its greatest diseases and its greatest injuries thus lie hid during life, are those of smaller account, such as partial ulcerations or a strain, or any kind or degree of mechanical hurt which may be conceived to come from a shock, likely to make themselves more surely known?

But these shocks of the heart, though nobody knows what they really are, yet have emergencies which need to be treated at the time of their occurrence. And treated they have often been successfully in different measures. In some life has been saved, no small thing surely! And in some, moreover, evil consequences have been altogether prevented, and in some postponed. I have a few more fragments of cases worth relating for the sake of what they seem to teach practically. I will tell them as shortly as they can be told.

A young man between twenty and thirty, who had lived very hard in the way both of incontinence and intemperance, was seized in the midst of some vigorous pastime (I think it was rowing) with sudden pain of the heart and excessive impulse and the sense of approaching death. His physician, ministering to present emergencies, bled him largely. And the relief that followed the remedy was so marked and manifest to the feeling of the patient and so instantaneous that he was sure it saved his life. But though his life was saved, abiding pain and abiding palpitation still kept it in jeopardy, for they incapacitated him for exertion during many weeks, and in the meantime occasionally rose to the same excess and were accompanied by the same sense of dissolution as at first, and needed, and were relieved by, the same remedy.

Now, it was not until after the lapse of two or three months from the original attack that this person fell under my observation. He had then returned to the business of life, but he was ill able to fulfil it. Palpitation of the heart was still a check upon all bodily exertion and all mental effort. I have now known him and seen him at intervals for more than two years, and still the palpitation remains. I find simple excess of impulse without any unnatural sound, but I am not certain that the heart has undergone any degree of hypertrophy. Twice or thrice during these two years the palpitation has run on to excess, and a death-like feeling has come over him. He is engaged in a profession. But whatever he does, business and pleasure, and eating and drinking, are all under the restraint of continual watchfulness for the sake of moderating the palpitation of his heart.

What was the nature of the injury originally incurred and what is the kind of malady at present suffered in this case I cannot tell; but whatever they be, they distinctly proceeded from a shock of the heart more than two years ago.

Take another case. A young man twenty-two years of age was with his regiment at the Cape of Good Hope. He had been extremely intemperate and incontinent in his habits for two years and more, and he had suffered occasional palpitation of the heart. One night he went to a ball, and danced till morning, and then plunged into a cold bath and appeared on parade. But he found himself brought to a stand by violent palpitation. He felt as if his heart had suffered injury, and he was incapacitated from duty from that very hour. But he had not then the death-like sensation, which is apt to come with the shock. Yet he did not escape it. For about a fort-

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night afterwards the palpitation, which had never ceased, suddenly ran on to extreme violence, his lips turned blue, pain seized the left side and he thought himself dying. He was at once largely bled, and felt sure that the bleeding saved his life; and three days afterwards he was cupped with great relief. His life however was still considered to be in jeopardy for a month. When he could be safely removed he was sent to England. It was five months from the time that the heart may be supposed to have received its shock, before I saw him. He had been sixty-eight days at sea, and in England for a month. The quiet of the voyage had brought down his palpitation almost to nothing, and, when he reached England, he believed himself almost well. But his palpitation had returned and had been increasing for the month he had been at home, although he had been passing the life of an invalid. I found him suffering simply palpitation. I thought the sounds of the heart loud, but otherwise quite natural. Moreover, I perceived a slight bulging of the ribs over the præcordial region, but I could not satisfy myself of any undue extent of præcordial dulness, and upon the whole I could not make up my mind whether there was, or was not, any degree of hypertrophy.

This young man continued to visit me at intervals of about a fortnight for three months. He was enjoined and (I believe) he practised the greatest care to avoid every thing which could be thought capable of conveying an injurious impression to the heart either through the body or through the mind. Nevertheless the heart did not cease to beat with some excess of impulse at all times, which very moderate bodily exertion and very moderate application of the mind to business were sure to increase. And at the end of the three months I had more fear of hypertrophy than at the beginning.

The issue of these two cases, of the one after more than two years, and of the other after nine months is still in suspense. The issue to be apprehended is progressive hypertrophy and dilatation. In both, I consider that life was saved, and that these disastrous terminations have been thus far postponed, and may possibly be prevented, mainly by the treatment fortunately employed at the time of the shock, and by the extreme care and discipline to which the patients have ever since been subjected.

Such treatment and such care and discipline are sometimes successful in the largest sense, as the following case will show. A friend of mine, then two or three and twenty years of age, was dining at some distance from home when a messenger came to tell him that his father's house was on fire. Off he set as fast as he could. And running down Oxford Street he came in fearful collision with a man who was running in equal haste the other way. Down they both fell. My friend recovered himself. What became of his antagonist he never knew. He himself crawled home with some difficulty. Further than this I am not informed what was the immediate effect of the shock. But from that time he was seriously ill for many months. His symptoms were altogether referable to the heart, and consisted of excessive impulse and pain. He was attended by the late Dr. Baillie, who bled him largely. The remedy must be considered to bespeak the nature of the emergency, and the belief of some serious injury or disease sustained by the heart. After the lapse of many months he was allowed to return to the business of life. He had then lost his *constant* palpitation. But for a few years it was wont to return painfully upon occasions of excitement. At length he lost it altogether; and lived five and twenty years after the shock and the perilous illness, which followed it, actively engaged in a laborious profession.

Let me add a notice of two more cases which occurred when I was a student at the hospital. A man passing through Spa Fields one night was unmercifully beaten and plundered, and thrown into a ditch and left to die. Die, however, he did not, but lay there he knew not how long; for he was insensible. The next day he was found and taken home. He was disabled by the bruises he had received, and by *palpitation* of the heart and dyspnœa which he had never complained of before, and was never again able to return to his ordinary occupation. After some months he was admitted into St. Bartholomew's, dropsical, and bearing all the symptoms which denote hypertrophy and dilatation of the heart. He soon died, and his heart was found of a size which was almost incredible. All its muscular substance was enormously amplified, and all its cavities enormously dilated, its pericardium and lining membrane and valves free from disease.

Nearly about the same time a poor fellow died in St. Bartholomew's, who suffered the same symptoms during life, namely, dropsy and excessive palpitation and dyspnœa, and in whom were found the same conditions of the heart both in what it did, and what it did not, display of unsoundness after death, namely, hypertrophy of the muscular substance and dilatation of the cavities, with the pericardium and the internal lining perfectly healthy. And this man ascribed his mortal complaint to a paroxysm of anger, and referred its origin distinctly to a particular occasion. He was naturally irascible; and one day his wife having offended him in a transport of rage he seized a knife, and was just plunging it into his own throat, when the poor woman rushed upon him, disarmed him, and disappointed his purpose. Some neighbours came in and secured him until his rage had burnt itself out. But from that day he had always been sensible of a palpitation of the heart, which had gradually increased until it incapacitated him for work. Then he became dropsical, was admitted into the hospital and soon died. All was the work of not many months.

But is it quite certain in these cases that the hypertrophy and dilatation really came from a material injury done to the heart at the time of the shock? In neither of them did the heart present the visible traces of any such injury as could be conceived to proceed immediately from violence. Still I do not know that any thing short of absolute disruption must necessarily leave the characteristic marks of itself ever afterwards. It is conceivable that the injury itself might not be of a permanent nature, and yet abide long enough to lay the foundation of permanent disorganisation. Further it is possible that, in these same cases, causes might have been found in other parts of the body (for such it will presently appear there often really are) entitled to a share in producing what was found in the heart. Nevertheless the shock, that had been suffered in both cases, was a remarkable part of their clinical history. The patients themselves constantly ascribed to it the origin of all their malady. We cannot therefore exclude it from our consideration, and may venture, without speculating further upon what cannot be proved, to regard it as in some manner powerfully conducive to the hypertrophy and dilatation of the heart, and to the fatal event.

LECTURE XXIX.

CLINICAL HISTORY OF THE HEART'S UNSOUNDNESS FROM DISORGANISATION CONTINUED.—CAUSES EXTERIOR TO THE HEART CONDUCIVE TO IT.—DILATATION AND CONTRACTION OF THE AORTA.—CERTAIN DISEASES OF THE LUNGS.—CURVATURE OF THE SPINE AND DEFORMITY OF THE CHEST.—GENERAL DISEASE OF THE ARTERIES.—COINCIDENT DISEASES OF DISTANT PARTS.—LIVER.—SPLEEN.—KIDNEYS.

BEAR in mind that we have been considering the *clinical history* of the heart's organic unsoundness after it is already brought within the scope of *clinical diagnosis*. This clinical history we have thus far found involved in its own prior diseases or its prior accidental injuries, which are tantamount to diseases, and their unrepaired effects. The heart itself then has thus far appeared to contain the conditions conducive to its disorganisation.

But the clinical history of the heart's organic unsoundness takes a wider range. Conditions conducive to it are found, beyond the heart itself, even in other organs both near and remote, and in the constitution at large!

Of these conditions themselves, in the mode of their operation upon the heart, so as to alter its structure, some are easy, and some are difficult to understand, and some in the present state of our knowledge, quite inexplicable.

Dilatation of the aorta is often found coincident with active or passive dilatation of one or several of the heart's cavities.

Cases, however, are met with, where dilatation of the aorta subsists without the heart having suffered any change in its natural structure. The question, therefore, naturally suggests itself, whether the coincidence, when it does occur, really and truly exhibits the relation of cause and effect?

Cause and effect! These terms are allowed, indeed, in pathological reasoning; but its subject-matter seldom admits their use in that strict sense which philosophy would require. In pathology, so many counteracting circumstances, known and unknown, are perpetually liable to intervene, that it can hardly ever be said of anything that it exerts a power out of which some other thing must *necessarily* proceed. The present state of our knowledge will seldom permit us to affirm more than that a certain morbid action, or morbid structure, has its tendency to such and such a consequence—not its sure termination in it.

Thus a dilatation of the aorta may naturally tend to dilatation of the cavities of the heart, while circumstances may be perpetually interfering with the result. Of these, some are easily appreciated.

A dilatation of the aorta may exist, but the still and sedentary life of the individual may postpone or prevent the full force of the injury from being felt by the heart. Again, since all harm resulting to the heart from the aorta must be through the medium of the current of blood passing from one to the other, it will be more or less likely to take effect according to the greater or less plenitude of the blood-vessels; and thus in the present case of dilated aorta, the full and plethoric will, there is reason to believe, suffer disorganisation of the heart sooner and more surely than the pale and exsanguine.

Disorganisation of the heart from a dilated aorta being of tardy growth under all circumstances, and being still liable to be further postponed by accidents, it cannot happen contrary to our expectation that death should often take place and exhibit the one without the other.

But by what agency does the heart become disorganised in consequence of a dilated aorta? It is, probably, by its own extraordinary efforts to overcome a virtual impediment to the circulation. Blood being immediately poured from it into a larger space than natural, requires from the heart an augmentation of its motive impulse.

I believe that a dilatation of the aorta is more apt to disturb the action of the heart, and ultimately to injure its structure, when it occurs as a general enlargement of the vessel over a certain space, than as an abrupt expansion in the form of a sac; and I believe also, the nearer it is found to the origin of the aorta, the more capable it is of producing these effects.*

But an unnatural narrowness of the aorta no less than its dilatation there is reason to place among the causes conducive to disorganisation of the heart.

I have not been able to lay my hands upon the notes I took of a case illustrating the point in question, which occurred several years ago. The circumstances, however, were so striking, that I can trust my memory, I think, for the accuracy of the detail.

A little boy, between four and five years old, and very puny of its age, was brought to the hospital in its mother's arms. Its countenance betrayed great anguish, and its respiration was exceedingly hurried; and there was no part of the chest where the heart could not be felt acting with enormous impulse; at the same time the pulse at the wrist manifested nothing extraordinary. There was, I recollect, no remarkable blueness of the lips, or other evidence of impediment to the passage of blood through the lungs: the hurried breathing seemed to depend upon the simple vehemence of the heart's action.

What could be the nature of the case? The age of the child first made me think of congenital malformation: but all the malformations I was acquainted with were such as had the effect of mixing venous and arterial blood, and distributing it throughout the body. But here no such effect was apparent. My next impression was, that the heart had become dilated in consequence of an adherent pericardium; but the mother could give no account of any rheumatic attack which the child had ever suffered, or of any acute disease whatever which had fallen expressly upon the chest; on the contrary, she had not observed the disorder to arise at any particular time, nor could she trace it to any particular cause. The child, she said, was healthy for some time after its birth, and it was not until after it was weaned that the "*strange beating*" within its chest was noticed, which had continued gradually to increase.

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* The aorta was found greatly dilated in a certain case, quite from its origin to its arch, and thickly interspersed with bony scales, like drops of white wax which had cooled; and the heart itself so thickened in its whole muscular structure, and so dilated in all its cavities, as to equal the heart of an ox.—*Morgagni*, xviii. 28.

The aorta, in another case, was greatly dilated; quite from its origin to the neighbourhood of the emulgent arteries, and rigid through the whole of this tract, from the deposition of bony lamellæ; and all the parietes of the heart thickened; and both ventricles, especially the left, much dilated. *Ibid.* 30.

In another, the aorta was dilated from its origin throughout half its descending portion through the chest, its internal lining being discoloured and thickened, and furrowed, and exhibiting here and there some bony lamellæ; while the heart had both its ventricles much enlarged in their capacity, and somewhat thicker than natural in their parietes.—*Ibid.* 34.

A few days only elapsed between its admission into the hospital and its death. The manner of its death was peculiar: it suddenly became pale, and the heart, which an instant ago struck forcibly against the ribs, was only just perceived to move; the impulse was gone, and dissolution was looked for the next moment; but in this state, pale and cold, yet apparently sensible, with the heart just moving, and air passing in and out of the lungs, as it were mechanically, the poor child survived during a whole day, and then it ceased to exist.

Upon dissection the heart was found enormously enlarged, and every cavity greatly exceeding its natural capacity. To what extent, or in what parts its muscular structure was thickened or attenuated, I do not recollect; but the most remarkable circumstance which attracted our attention was this—that the aorta, and all its principal branches, while they were entirely free from disease, were by more than one-half less than their natural capacity.

The case upon record which bears the nearest resemblance to that just related, is one reported by Meckel, in the History of the Royal Academy of Berlin, for the year 1750. The subject was a puny girl, 18 years old. No further account is given of her history than that she had been, from time to time, subject to palpitation and anguish, and trembling of the limbs, from her infancy to her 14th year, and thenceforward the palpitation and anguish had become constant and more severe until her death.

Upon dissection the heart was found enormously enlarged, and the aorta, throughout its whole course, especially through the chest, and all its principal branches, marvellously narrowed. The heart had both its ventricles dilated, and their substance more soft than natural; it had its auricles also dilated, but the left to a degree far greater than any other cavity. It was capable of containing the prodigious quantity of twelve ounces, while the corresponding ventricle only contained four. The aorta was not more than half the diameter of the pulmonary artery.

From the history of these cases, it is evident that the narrowness of the aorta and its branches was a congenital malformation, and that enlargement of the heart was a natural and necessary consequence, and perhaps even an indispensable condition for the continuance of life.

But this narrowing of the aorta need not be so extensive as that which has been described, and yet may have the same effect upon the heart in influencing the dilatation of its cavities. A very limited and partial narrowing may, according to its situation, produce a mechanical impediment, of which the stress may fall upon the heart equally, or almost equally, with one which is more extensive. In a case where the aorta is represented to have been "*contracted* to an amazing narrowness" near the heart, the heart itself is said to have been *dilated* to an extent "never before seen," the dilatation appertaining especially to the right auricle and ventricle.* Surely a contraction of its calibre in this situation would serve as effectually to impede the exit of blood from the heart as if it belonged to the whole aorta and all its branches. But when contractions of the aorta occur in situations more remote, there is much less certainty of any injury resulting from them to the structure of the heart.

Among the causes exterior to the heart capable of producing its disorganisation, we must not omit the consideration of those which are seated in the lungs; for none are better authenticated. Owing to the peculiar structure of the lungs, and their proximity to the heart, inflammation and its consequences (effusions and depositions) may well be conceived to offer impediments to the transmission of blood, which the heart must feel and resent. And they really do so. The effects upon the heart, however, are partial only, and limited to the right side, and consist of dilatation of its cavities.

Whatever diseases of the lungs can so change their structure as greatly to limit the free space for the transmission of blood, if they be diseases of frequent occurrence, must, one should suppose, be all well known as frequent, and almost certain, causes of this partial dilatation of the heart. And in the subjects of pulmonary consumption, where the natural structure of the lungs is often obliterated to such an extent that hardly any free space remains for the transmission of blood, one might expect to find the most numerous instances of such dilatation. But, in point of fact, it is rarely found in combination with tubercular disease of the lungs.

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* Morgagni, xviii. 6.

Now, it is not the quantity of impediment within the lungs themselves taken absolutely, but relatively to the quantity of blood required to circulate through them, which becomes the occasion of the heart's dilatation. The impediment may be very great; so great that *one half* of the lungs may be solidified, and yet there may be no dilatation of the right cavities, if at the same time the mass of circulating blood be diminished by one-half. This is actually the case in pulmonary consumption. During its progress there are operations at work in the constitution at large, which are daily deducting something from the general mass of blood; so that in the end, though there be but *little* of the lungs in a pervious condition, yet that little is still adequate to transmit the *little* blood which remains in the circulation; and thus, though the absolute impediment in the lungs is very great, there is no detention of blood in the right cavities of the heart, and no dilatation of them.

It is remarkable in this disease, how those symptoms which are considered to be of the most fatal omen, seem to arise out of an express provision of nature for prolonging the duration of life. The hectic perspiration, the occasional diarrhœa, the sputa, the languid powers of nutrition, all tend to keep down the current of blood to that measure which can obtain an easy passage through the lungs. On any other terms the patient would die of suffocation suddenly, and at an early period of his disease.

Nevertheless, it is still the tendency of obstruction in the lungs to produce accumulation of blood in, and consequent dilatation of, the right cavities of the heart; although in phthisis pulmonalis, where the obstruction is the greatest, such dilatation is rarely met with, owing to peculiar conditions of the general circulation. The influence of causes seated in the lungs in producing dilatation of the right side of the heart, is best seen in diseases which, while they create great impediment to the transmission of blood through them, may nevertheless subsist for years without much injury to the general health, without special injury at least to the nutrient functions of the body, and without any notable diminution of the general mass of blood.

Such are the diseases commonly called *asthmatic*, diseases which differ from each other in their essential nature, but agree in certain common effects, such as in impeding the respiration permanently or at frequent intervals; in permitting the continuance of life for years; and in not diminishing the general bulk of the body, or the general mass of the blood, but sometimes even allowing both to increase. According to my own observation, the subjects of asthmatic diseases furnish the most frequent instances of dilatation of the heart from causes seated in the lungs.

Deformity of the chest, resulting from curvature of the spine is justly reckoned among the causes capable of producing disorganisation of the heart, especially active or passive dilatation; or, it may be, dilatation both of one kind and the other co-existing in the several cavities of the same heart. The whole chest being distorted and narrowed, and the lungs straitened and imprisoned, and the heart itself displaced and the aorta tortuous, and the liver bearing hard with its external pressure, lead upon the whole to as large an amount of hurtful encroachment of organ upon organ as can possibly be conceived. And this encroachment cannot be without mechanical impediment; and this impediment cannot be without hurt and hindrance, first, to the functions, and then to the structure of such organs as the heart and lungs.

Of the causes, then, exterior to the heart capable of producing its disorganisation, these are they which are the most acknowledged and the best understood; dilatation and contraction of the aorta; certain diseases of the lungs; and deformities of the chest. They seem all to bring about their common result by the one way of impediment to the free passage of blood from the heart into the arteries.

That active and passive dilatations of the heart may result from impediments to the course of the circulation, either real or virtual, is one of those conclusions in pathology most certainly established. But the theory, which is unquestionably just within certain limits, has been enlarged to an extent which neither facts nor right reason will verify; for some have discovered in an aneurism at a remote part of the aorta, or in a plug of coagulated blood in some of its immediate branches, *positive impediments* capable of being felt and resented by the heart, and thus necessitating its disorganisation. And others have been too ready in resolving into *virtual impediments* many merely speculative modes of morbid action, which belong to the capillary blood-vessels.

With respect to a real mechanical impediment, it is probable that, in order to become a certain and effective cause of disorganisation of the heart, it must be situated either in the heart itself, or not very remotely from it. I certainly never met with a case myself, and I find none upon record, where, the heart being disorganised, and no disease being found at any of its orifices, and none in the lungs, and none in the thoracic aorta, there was still any mechanical impediment at a remoter part of the vascular system to which its disorganisation could be fairly ascribed. When any such distant impediment exists, every collateral artery, given off between the obstructed or contracted portion and the heart, will furnish it an additional security against injury; for how far soever the obstruction is felt from the seat of the impediment, so far these vessels will and must dilate, and will thus, in proportion to their number, re-establish the freedom of the circulation, and effectually secure it.

With respect to impediments arising out of morbid actions in distant parts, I cannot so easily accommodate my mind to an hypothesis as to believe all that is pretended concerning them. I find depositions of lymph in the cellular texture of a limb, constituting what is called a solid œdema; I find tubercular depositions in any organ, such as the liver; I find even simple inflammations of distant parts seriously insisted upon, as if they were well authenticated causes of disorganisation of the heart when they have happened to exist together with it. And the *theory of mechanical obstruction* is brought in confirmation of the fact. For, say the theorists, where there is inflammation, there must be spasm of the extreme vessels, and spasm is tantamount to obstruction. And again, where there is effusion or deposition of any kind, there must be pressure upon the neighbouring blood-vessels, and pressure must produce obstruction, partial or complete, according to its degree.

Now, by parity of reasoning, there is no conceivable sort of morbid action in any part of the body, which may not be construed into an obstruction of the blood-vessels, and thus conjured into a possible cause of disorganisation of the heart.

But, to dwell only on those specified conditions of other parts of which there is no doubt that they hold the place of causes naturally conducive to the heart's organic unsoundness, namely, dilatation and contraction of the aorta and certain pulmonary diseases and deformity of the chest, has our knowledge of them, as such, any real practical use? Indeed it has. For these causes, conducive to its organic unsoundness, are ever at work, covertly or manifestly, in beginning, furthering, and accomplishing it. They are parts of its living pathology. Being parts of its living pathology, they belong to its clinical history so far as during life they can become objects of our knowledge. And in part they can, and in part they cannot.

Dilatation and contraction of the aorta are reserved for detection after death. It is not until then, that they are found to have been covertly working out the heart's unsoundness during life. They did not, and could not enter into its clinical history.

But the peculiar forms of pulmonary disease are cognizable enough during life, and are manifestly seen all along bearing hard upon the heart, and the heart's unsoundness is seen all along growing under them. In the treatment of such affections of the lungs we never disregard what may happen, or what has already happened, to the heart. The lungs, beside what their own impeded functions require for themselves, are perpetually suggesting to us indications, how best to prevent or postpone or palliate the expected or the actual and growing unsoundness of the heart.

Deformity of the chest too is cognizable enough. But it is a thing of degrees. It may be extreme from birth. And then the heart in its first growth may suffer itself to be so wrested from its true place and shape, and from its true bulk and capacity, that its vital functions become impossible, and the child quickly dies. Or it may be such from birth as to make the heart grow shapeless, monstrous, and out of place, and yet allow it to continue the offices of life for years, provided care be taken to avert from it all casual influences of an injurious sort. Thus the very deformed often reach the age of puberty, and then die; or under a penal vigilance of all occasions, accidents, and circumstances that can harm them, they sometimes attain a moderately advanced period of life.

In almost all cases, where life continues with extreme deformity of the chest, the organic unsoundness of the parts within is complex. The lungs and the heart suffer equally; and, beside the common causes conducive to the unsoundness of both alike, each is continually helping on the unsoundness of the other.

Unquestionably a numerous class of cases still remains, in which the heart is found with its cavities dilated, and its muscular substance in a state either of hypertrophy or of attenuation, while at the same time nothing is discovered to which this disorganisation can be expressly ascribed, either in the heart itself, or in the thoracic aorta, or in the lungs, or in deformities of the chest; and we are left to seek in the condition of more distant parts, or in the habits or casualties of the patient's life, or in his previous diseases, for something which will bear to be suspected as the cause or occasion of its production. These cases must now shortly engage our attention.

In the phenomena of health and of disease, there are things concerning which the present state of our knowledge is totally inadequate to explain how they are or why they are: yet of many such things we may still know more than their bare existence. We meet with peculiar organic diseases, and we may be at a loss to explain the exact physical process of their production: yet we may remark many circumstances so constantly preceding or accompanying them, that we can hardly doubt that there exists between them *some* kind, although we know not *what* kind, of physical alliance. It has never occurred to me to meet with active or passive dilatation of the heart in a body otherwise perfectly sound. The concomitant diseases have not indeed had, at all times, a strictly accountable connection with it; yet they have, in a manner, rendered its existence more intelligible.

The coincidence of disorganisation of the heart, especially of its hypertrophy and dilatation, with the marks of chronic disease extensively diffused throughout the arterial system, is very common. The internal lining of the arteries, here and there, in various situations, and upon the whole to a great extent, has lost its transparency, and become a little thickened, and dotted with cartilaginous and atheromatous and bony deposits; but nowhere has its change of structure been such as could be thought capable of producing injury simply by mechanical impediment. And this may be all that is found in the body to account for the heart's unsoundness. But this mere beginning of disease in the arteries, which is indeed a small matter when we see it in single blood-vessels, becomes a great matter, and capable of great effects when it spreads itself throughout the body. It may well be conceived enough to make itself felt by the heart.

In looking over such records of cases as I possess, it is remarkable in how large a proportion of them I find this condition of the arteries coincident with hypertrophy and dilatation of the left ventricle. And this, I have said, may be all that is found in the body to account for the heart's unsoundness. But oftentimes there is this and much more than this. We see that the disease of the arteries has reached a more onward stage, and made larger and more extensive deposits of cartilage and atheroma and bone, while the liver and the spleen and the kidneys are found enlarged and granulated; and the transparent membranes, as the pleura and peritoneum, are thickened and opaque. These are evidences and effects of chronic inflammation, and have a pathological connection one with another. And it is strange, if they have not also a connection with the disease diffused throughout the arteries; and it is strange, moreover, if they have not all a connection with the hypertrophy and dilatation of the heart.

But in speculating upon diseases and disorganisations of other parts as the causes conducive to diseases and disorganisations of the heart, we must be cautious that we do not invert the real order of things. For the order of causation will be found to run as often from the heart to other organs as from other organs to the heart.

Must we, however, be content to speak of these things as customary coincidences only, or must we try and prove the essential nature of the relation which seems to bind the several organs together in one pathological link, and the heart among the rest? The truth is, we *can* only speak of them as coincidences. We are not sure that we possess a single element towards a proof of the process how they come to pass, and how they are brought together. We want new facts to help us.

And indeed this is the age for finding out new facts, and testing their truth under various aspects. But the time has not come for putting them all in order, and assigning them their right places, and building up systems with them.

The greatest single pathological fact disclosed during the present century, is that which we owe to the research and sagacity of Dr. Bright—the morbid unsoundness of the kidneys attested by the presence of albumen in the urine. It is a fact largely suggestive of things beyond itself, of new elements of disease, and new modes of morbid action. With whatever forms of disease, and in whatever organs of the body, the physician has to do, he will sometimes meet with this fact in them all. And assuredly wherever he finds it, it holds an important pathological place, though the present state of our knowledge may not enable us to say what that place is.

It is easy to talk disparagingly of the best things. It is easy to talk of this, merely as of one more incurable malady, added to the many which were too well known already. But do we not judge of present diseases, whence they are, what they are, and whither they tend, by the nature of the coincident facts belonging to their clinical history? Now coincident with how many and with what various classes of disease do we not find this momentous fact, this sure index of granulated kidney, albuminous urine?

There are dropsies, and yet at the same time no known impediments of the circulation to satisfy their mechanical theory, or that theory of them which is best understood. But their great coincident fact is albuminous urine.

There are hæmorrhages, bronchial and pulmonary, with sound heart and sound lungs; intestinal hæmorrhages, with sound abdominal viscera. But their great coincident fact is albuminous urine.

There are inflammations of external surfaces, as erysipelas; and of internal surfaces, as peritonitis and pericarditis, arising suddenly, yet without any known sudden impression. But the great coincident fact is albuminous urine, forming part of their clinical history; and it is strange if it also does not form part of their essential pathology.

To come to particular organs, as the brain: some of its smaller affections will put on a peculiar character of permanency and intractability without further evidence of harm to its own structure; vertigo and pain will be abiding and incurable and incapacitating, while the urine is albuminous. And some of its graver affections will come and go and admit of a present relief, which is unusual when harm has befallen its own structure; convulsions and apoplexies appear and disappear and yet are ultimately fatal, the chief concomitant circumstance which attracts our notice being albuminous urine.

And so too of the heart, it will palpitate without apparent cause inherent in itself; it will undergo organic unsoundness still without cause belonging to itself or to other parts, save what can be inferred from the presence of albuminous urine.

But the kidneys being unsound, and betraying their unsoundness by albuminous urine, what is the common agency by which these multitudinous effects are brought to pass? How does disease befal many organs simultaneously, or how is it handed from organ to organ, from blood-vessels to solid viscera, from the liver and the kidneys to the brain and the heart? Is it through the blood itself and a poison in the blood? Probably it is. Pathology will perhaps settle the question after the lapse of years. But in the meantime practical medicine must condescend to humbler things, and to seek for causes, if they deserve the name, out of the body. Prior to diseases, to their diagnosis, their history, and their treatment, prior to them and beyond them, there lies a large field for medical observation. It is not enough to begin with their beginning. There are things earlier than their beginning, which deserve to be known. The habits, the necessities, the misfortunes, the vices of men in society contain materials for the inquiry, and for the statistical, systematising study of physicians, fuller, far fuller of promise for the good of mankind than pathology itself.

There will always, I presume, be a higher degree of certainty, what those things are which entering into the body produce diseases, than either how they produce them, or what the diseases themselves are when they are produced. Finding in particular classes of men predominant modes of living and predominant diseases, and finding the same diseases follow the same modes of living in individuals of all classes, we are more sure that the modes of living produce the diseases, than we probably ever shall, or ever can be, how they do so. We are more sure that the habitual and intemperate use of spirits leads to extensively diffused deposits of cartilage and atheroma and bone within the arteries, to hæmorrhages from mucous surfaces, to thickening and opacity of serous membranes, to cellular effusions, to granulated kidneys, and to augmented bulk and capacity of the heart, and to a poisoned and corrupted blood; we are more sure, I say, of the *outward* cause, than we ever shall or can be of the inward root, germination, and growth, or of the natural order and sequence of these diseases, by which mankind suffer and perish hopelessly and inevitably.

Our surer knowledge, which regards external causes, is most within our reach. Its fruit is most appreciable and at hand. It concerns the prevention of what is often incurable. It claims an industrious pursuit under a moral obligation, if not from its scientific character. But our more precarious knowledge, which regards internal operations, is what we are most proud of. We learn and we unlearn, and win a truth after the labour of years, and cannot help putting a high price upon it. And indeed it has a scientific value which I will not venture to dispute or to depreciate.

LECTURE XXX.

TREATMENT OF UNSOUNDNESS OF THE HEART IN SOME OF ITS PRINCIPAL FORMS.—TREATMENT OF VALVULAR UNSOUNDNESS.—IN VALVULAR UNSOUNDNESS THE EXPECTATION OF MEDICINE IS NOT TO CURE IT BUT TO STOP ITS INCREASE, OR TO POSTPONE ITS CONSEQUENCES.—THE NATURE OF THE DISEASE IN WHICH THE VALVULAR UNSOUNDNESS ORIGINATED LIMITS OR ENLARGES THE EXPECTATION. — ALSO THE AGE AND CONSTITUTION OF INDIVIDUAL PATIENTS.—CASES.

HAVING now passed in review the several forms of the heart's unsoundness, whether they proceed simply from disease, or simply from disorganisation, or are a complex of both, and having considered their clinical diagnosis, and their clinical history with the conditions prior, preparatory, and conducive to them, whether in the heart or beyond the heart, in the body or without the body, we come better prepared for enquiring into their treatment. We may perhaps already calculate, from the nature of things, the probable expectation of remedies addressed to them; but we must see also what from experience are their actual effects.

Valvular disease of the heart, as far as I at present either know or believe, can only be contemplated in reference to its cure, when it is a part of endocarditis, and is of the nature of inflammation. Of its treatment as such enough has been said already.

That valvular unsoundness which remains after the subsidence of inflammation, and that which is the result of slow and covert disease, may not be beyond the reach of medical treatment for every purpose, but beyond its reach it certainly is for the purpose of cure.

What medical treatment can do, and what purpose it can answer in such forms of disease, now comes to be considered.

Where the valvular unsoundness is small, and hitherto little or not at all complicated with other disease of the heart, medical treatment has sometimes succeeded in withholding it from *becoming greater*. It has restricted it to what it is, and at the same time prevented or greatly postponed those further structural changes in the same organ which are naturally liable to follow.

Valvular unsoundness may exist, and there be no extraordinary impulse of the heart within the chest, no habitual disturbance of the circulation, no jerking of the arteries, no congestion of the veins, no hindrance of growth or nutrition to the body at large, no impediment of any function which it belongs to blood or blood-vessels to perform, and no consciousness on the part of the patient, under any circumstances, of the least drawback upon the powers and capacities of health. The fact of the unsoundness is a secret known only to the physician; and the single sign denoting it is a loud endocardial murmur.

Or valvular unsoundness may exist, and there be perfect health to *our observation* in every thing besides, yet to the patient's own feeling a certain amount of conscious drawback. He may have learnt, that there is a degree of bodily exertion which he cannot reach without some painful hurry of breathing and some palpitation of heart. But if he were always careful to keep within that degree, he would never know that he was ill.

The most frequent specimens of valvular unsoundness, existing under these conditions, are found in those who at some past period of their lives have suffered an attack of acute rheumatism in which the heart was affected. And then a great deal is within the reach of prudent management for averting further evil.

The first aim of the physician in such cases should always be to make the patient clearly to understand what his state is, and to see the reasonableness of the advice that is given him. For his treatment, though it may proceed upon our suggestion, must be entirely carried on by himself. It must engage every hour of his life, and be allowed to interfere with all his habits, and conduct, and objects. A man, therefore, had need be well persuaded, that what we require him to do is right, when the doing it calls for so large an amount of self-sacrifice.

And indeed there are cases in which experience allows us to hope sanguinely, and to promise largely upon the faith of good resolutions, and fair obedience on the part of our patient. For, though he have immoveably fixed within his heart the element of fatal disease, yet upon the condition of strict and habitual temperance, and habitual self-control over body and mind, (no easy condition I allow,) he may count upon living long and not unhappily, and upon postponing to a distant period the evils which threaten his state, or even upon escaping them altogether.

Now there is in these cases a special and peculiar ground of hope; and it is well that we should see and clearly understand what it is. The small amount of valvular injury, and the probability that the heart has hitherto undergone little or no change of structure besides, and the present unembarrassed state of the general circulation, are all favourable conditions. Yet the special ground of hope does not rest here, but upon the fact that the valvular injury had its origin in a certain casual attack of inflammation. The valvular injury from this cause, though it be incurable, does not increase but remains (there is reason to believe) of the same exact amount, be it more or less, at which it was left when the inflammation finally ceased. If it be small, it remains small, and the evil consequences to which it naturally tends, such as dilatation and hypertrophy, are slow to emerge. If it be large, it remains large, but does not become larger, and its evil consequences emerge more rapidly.

But the amount of valvular unsoundness left by acute rheumatism is not always small. It may be very large. And this is the chief cause of the widely different periods to which men are found to survive the damage thus done to the heart. The valvular unsoundness, according as it is small or great, considered as the germ of future evil, takes a longer or a shorter time to develope its consequences and to bring them to their fatal maturity. Be it, however, small or great, if its evil consequences have not yet arisen, there is always a better chance of postponing them in these, than in other cases where there is the same amount of valvular unsoundness from other causes. That such is the matter of fact I am sure from experience; and, that the reason of the thing is as I have stated, I am pretty confident.

Let us then now turn to the cases of valvular unsoundness from other causes, and consider their treatment with reference to its only possible aim, viz. the postponement of evil consequences which are yet to come.

There are cases in which auscultation finds a loud endocardial murmur constantly present, denoting an injury of the aortic or the mitral valve. And this is all we are sure of. There may be, besides, some slight hypertrophy, or some slight dilatation. But at all events the more formidable consequences of valvular injury are not yet apparent, and now is the time and opportunity for their postponement, if indeed they can be postponed. Accordingly we lay down strict injunctions for the patient's habitual management of himself. And this is all we can do. But we do it with little hope of putting off to any distant period the fatal evils to which the valvular injury naturally tends. But why not with the same hope in these as in the former cases? Because in these the origin of the valvular injury cannot be traced back to any certain time, or to any known attack of inflammation, but it has arisen from slow, covert, and imperceptible disease. And, having arisen thus, experience forbids us to reckon upon any long delay of its worst results. And the reason of the thing tells us why.

There are diseases which are covert and imperceptible in their beginnings, and still covert and imperceptible in their progress, until at length they have wrought some palpable disorganisation of parts, and thus make discovery of their existence. By the time however they reach this point, the constitution adopts them as a part of itself, and so they can never afterwards cease, but must go on still covertly and imperceptibly augmenting their effects.

Disease of the endocardium is often of this kind. We first know of its existence by the valvular injury which it has already produced. The valvular injury may yet be small, but the disease which produced it is still in progress and still going on to augment it. Our aim is not its cure, but the postponement of its evil consequences. Yet do what we will, we can expect little success, while the original disease is ever at work, and the original unsoundness is ever on the increase.

Further, such disease is seldom restricted to the heart. It is almost always simultaneously going on within the arteries. Hence the injury, which it has already done to the one, is a strong presumption of the like injury done or doing in the other.

If, therefore, the valvular unsoundness taken alone be little likely to have its evil consequences postponed, much less likely is this postponement when the valvular unsoundness is combined with depositions of various morbid products largely throughout the arteries.

It appears, then, that valvular unsoundness, itself absolutely incurable, is apt to admit of long postponement, and delay of the evil and fatal consequences to which it tends, when it is in its own nature stationary and unincreasing. And we judge it most likely to be stationary and unincreasing, if its origin can be distinctly traced to some known period and to some certain attack of accidental disease. On the other hand it appears, that valvular unsoundness is apt to admit no such postponement of its consequences, when it is in its own nature progressive. And we judge it most likely to be progressive, if it be the tardy growth of covert and imperceptible disease.

But neither what we know of the pathology of valvular diseases, nor what we know of their clinical history, will allow us to set up absolute rules of judging what will be their consequences and events in all cases, or how far they can or cannot be postponed.

I have known a few cases in which the fact of detriment done to a valve of the heart has been unquestionable; and I should have expected, from circumstances, a very different event from what actually happened. Their clinical history has not been marked by any known attack of accidental disease which could have come and gone, and injured a valve and left it unrepaired. But the valvular unsoundness has taken place covertly and imperceptibly, and there has seemed to be no reason why the hidden disease, which first formed it, should not still exist and go on continually to augment it. But for years and years it has remained apparently without increase in itself, and certainly without addition of any formidable consequence; and for years and years it has remained harmless, or nearly harmless, and the patients have been entirely unconscious of ailment, or sensible only of some hurry of circulation upon occasions of unusual excitement.

But, besides the circumstances which have been mentioned, there are others belonging to the age and constitution of individual patients, that would reasonably incline us to conjecture differently of the disease which caused the valvular injury, and to look for different results; to hope in one case that the postponement of its evil consequences was possible, and to fear in another case that it was not.

Youth and the aspect of health, and the known habits and enjoyment of health, and the known exemption from hereditary malady would encourage the hope that the disease, (or whatever it was,) which caused the injury, though we knew neither its nature nor the time of its occurrence, was accidental and had already ceased; and that it never extended beyond the compass of its still remaining effect in the valve of the heart. Here we hope indeed more than we know. But this is a rational hope.

On the other hand, advanced life and a cachectic aspect, and the known habits and ailments of intemperance, or some bad hereditary disposition strongly marked, or frequent attacks of some constitutional disorder, such as gout, or rheumatism, or gravel, would hardly suffer us to hope that the disease was single and solitary in the mere valve of the heart which it had injured, (though auscultation did not testify to more,) but would rather lead us to fear its universality in the whole arterial system. Here indeed we fear more than we know. But this is a rational fear.

I know two young ladies, whom, when I first saw them, one twelve years ago, and the other nine, I did not expect to be alive, and, but for one infirmity, both in perfect health at this day. I was called to see each of them on account of a loud systolic endocardial murmur, which had been just found out accidentally. In both it was audible throughout the præcordial region and far beyond it in front of the chest, and audible also extensively through the arteries. No kind of illness had occurred in either of them to which it could be reasonably imputed.

When the affection of the heart was first discovered, one was a child only four years old. She has now passed her childhood and reached her sixteenth year. In the meantime she has suffered several severe attacks of diffused bronchitis, also hooping cough and scarlatina anginosa. In the early stages of these diseases the heart's action was most violent and almost tumultuous, and active depletory remedies were employed.

During the last five years her health has been remarkably

l. She is very active and fond of exercise. The heart's
ulse is easily excited; but this appears to occasion her no
ress.

The other was in her tenth year, when the affection of the
t was first discovered. She is now in her nineteenth. In
mean time she has had scarlatina and measles. On these
sions, and whenever her circulation has been excited by any
al feverishness, she has suffered profuse bleeding from the
. She too, like the other, is brisk and lively. And the
ulse of the heart (I have observed) is raised by moderate
tion; but she is unconscious that it is so.

And now, in one after the lapse of twelve years, and in the
r after the lapse of nine, auscultation finds the same condi-
of the heart which it found at first, and nothing more. In
meanwhile, no treatment, properly medical, has been em-
ed for either. Both have been the objects of prudent care,
not of irksome restraint.

But who can tell the exact nature of the heart's affection in
e two cases? Without doubt there is a valvular imperfec-
in both. But *disease* may have had nothing to do with
lucing it in either. It may be a congenital imperfection.
single sign denoting it was indeed found out at a certain
by mere accident. But no one knows how much sooner it
ht have been found out, had it been sooner sought for. At
events this valvular imperfection, however produced, has
stationary for years and been causing all the while some
unt of impediment to the current of blood, but no graver
equences to the heart itself and to the constitution at large
, after the lapse of many years, hitherto resulted.

These cases are full of interesting facts.—Here is a valvular
erfection or injury. It has existed from birth or from very
y life. It still exists after many years. All along it has
endured by the heart without any notable change or
iment of its structure, without any painful drawback upon
health, the strength, or the comforts of life; and on the
e easy terms it is still endured.

Do not these facts give intimation of a certain *protective*
er possibly inherent in the *growing* heart, whereby it can
mmodate its form and manner of increase to material acci-
s and so redress or counteract their evil tendencies?

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Now it takes the experience of a vast number of cases to make a man wise enough to pronounce confidently upon the issue of any form of disease. And experience is a thing which we must wait for; we cannot make it for ourselves.

Indeed some forms of disease are so rare, that if all the experience of them which there is in the world were put together and possessed by one man, it would not make him very wise upon the matter.

Physicians however are in a manner often called upon to be wiser than they possibly can be. Disease or imperfection of a vital organ is a fearfully interesting thing to him who suffers it, and he presses to learn all that is known, and often much more than is known about it. He is especially solicitous to know what will be the result. Thus urged, we sometimes find ourselves giving opinions and prognostics, where our experience would hardly justify us in giving a guess.

What will be the end of the two interesting cases which have been related, I cannot take upon myself to pronounce. For I have no experience of other like cases to guide me. And yet the experience of these cases themselves hitherto seems to contain something of earnest and warning as to the future, something of promise, and something of fear and every thing of practical caution.

That a certain degree of hindrance to the current of blood through the heart should have existed, in one case for nine and in the other for twelve years, without inducing further change of structure in the organ itself, or doing serious detriment to various important functions throughout the. body, must encourage the hope that these great evils still admit of long postponement. And the same hope must be strengthened by all we know of the wonderful power of adaptation possessed by the body, during its growth and adolescence, a power, by which it contrives the means of bearing itself harmless and of conserving life. But on the other hand the little it takes in both these cases to rouse the heart to excess of impulse, and the readiness with which inflammation in one, and hæmorrhage in the other, are apt to break out, taking occasion from accidental diseases, are enough to denote that life is in some jeopardy. They suggest the need of continual watchfulness for averting or mitigating every disease or ailment or casualty, which through the body or the mind can impart a hurtful and hazardous excitement to the circulation.

Let me add the sketch of another case which, as far as it has gone, runs parallel with the two former. Here the valvular injury may have only very recently taken place. At all events it had only very recently been discovered.

A fine rough, robust, healthy-looking schoolboy, nine years old, was brought to me two years ago, and my attention directed to an unnatural sound of the heart, which the medical man of the family had accidentally found out about a month before. It was a systolic endocardial murmur, extremely loud, and audible in every part of the chest in front, round to the left axilla, about the left scapula, and especially in the space between it and the spinal column. The murmur was most intense just opposite the sigmoid valves, whence it was propagated along the ascending aorta, subclavian and carotid arteries. The second sound of the heart was a loud snap. There was no undue extent or degree of impulse from the heart, and no undue amount of dulness to percussion in the præcordial region. The boy laughed at the notion, that any thing was the matter with him. He was illustrious among his schoolfellows for gymnastic feats and all sorts of athletic sports. Climbing and swinging by one arm or one leg with his head downwards were favourite pastimes of his to the very day on which I saw him.

The parents of the boy, aware that something wrong had befallen his heart, naturally enough wished to know much more about it than I could tell them. I told them, however, what I knew of such cases, and made my little experience go as far as it would in the way of encouragement. I told them, in short, of the two young ladies, in whom there had been found years ago the same auscultatory sign, denoting the same sort of affection of the heart as I believed to exist in their own boy, yet who were alive and likely to live at the present day, enjoying a high degree of habitual health, while the affection of the heart remained still the same. I made also my little experience go as far as it would in the way of advice how to manage him. I warned them and the boy himself against such extravagant feats of strength as had been his custom, and recommended that he should come down to something a good deal more moderate in the nature of bodily exercise. And above all I insisted upon great watchfulness whenever he should be ill, especially whenever he should suffer any febrile attack. For I recollected the proneness to inflammation and hæmorrhage in the other two cases.

LECTURE XXXI.

TREATMENT OF HYPERTROPHY OF THE HEART.—DOUBTS WHETHER IT BE REALLY CURABLE.—COUNTERFEIT HYPERTROPHY.—SUPPOSED CASES OF CURE PROBABLY REFER TO IT.—TRUE HYPERTROPHY.—ITS TREATMENT CONTEMPLATES SOMETHING SHORT OF CURE.—BLOOD-LETTING.—LIMITS OF ITS USE.—SUCCESS AND FAILURE OF TREATMENT.—CAUSES OF FAILURE IN CASES APPARENTLY FAVOURABLE.

By most writers upon diseases of the heart I find its hypertrophy spoken of as curable. Its muscular substance having acquired even a large increase of bulk is considered capable of being again brought down to its normal size and normal force of action by medical treatment. And of the remedies contributing to this result I find venæsection represented as the chief. Now it would be unfair to mankind to abridge the hopes and efforts of medical men in all things possible for their benefit; and the cure of hypertrophy of the heart does not look like a thing which is in its nature impossible. But I must confess that, in the whole course of my experience, I never yet met with a single instance in which I was perfectly satisfied that it was cured. This negative experience of mine may not be worth much. Yet I have been a good deal in the way of such things; and it does appear rather strange that what others have seen so often I should never have seen at all. Therefore I may be pardoned for suspecting that physicians affirming, not the mere curability of hypertrophy, but its very frequent cure, were under some mistake.

At all events, this is one of the things which yet waits for proof from recorded cases. A late eminent writer* has stated that he had cases which afforded him "reason to believe that nearly the whole, who are under the age of forty, may be radically cured, provided the hypertrophy is exempt from complication with valvular or aortic disease, adhesion of the pericardium, softening of the heart or other organic obstacles to the circulation; and provided also that the constitution is sound and the general health tolerably good." But he has given no single specimen of his cases and was content with this general allusion to them.

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* Hope, 289.

I am well aware that there is a mock hypertrophy of the heart bearing so close a resemblance to the true that I should find no fault with you for being taken in by the counterfeit.

There may be violent impulse of the heart, felt not only in the præcordial region but in every part of the front of the chest upon which you lay your hand; and there may be pain in the heart, and pain and throbbing in the head; and all these may be never absent and often aggravated from time to time by accidental circumstances; and they may continue from first to last for several months or for several years, and produce in the mean while an incapacity of all useful exertion both mental and bodily: all these may be, and yet there be no hypertrophy.

Impulse of the heart, taken alone, however great and however extensive it may be, is not a sure physical sign of hypertrophy. Hypertrophy indeed cannot exist without excess of impulse, but excess of impulse can exist without hypertrophy. When the impulse of the heart is excessive, and at the same time its sounds are obtuse, muffled and indistinct, and the præcordial region presents a larger space than natural which is dull to percussion, then the signs of hypertrophy are complete. And hypertrophy so sure and unquestionable was never cured within my experience. But when the impulse of the heart is in excess, and at the same time its sounds are as loud and clear as ever, or louder and clearer still, and the whole præcordial region is quite resonant to percussion save the small space which is naturally dull, then the signs of hypertrophy are incomplete. Yet if this be enough to constitute hypertrophy, I have seen and treated it successfully in a hundred instances. But in the mean time I have not thought that I had to do with any such affection or ever claimed the least credit for curing it.

Cases of mock hypertrophy of the heart are indeed very numerous. Young persons at the prime of life are especially the subjects of it. They are often plethoric and often sedentary and can assign the origin of their complaint to no particular time and to no particular exciting cause. In them the excessive action of the heart is doubtless owing to a rich and redundant blood; and the cure of their simulated hypertrophy is effected by depletion and abstinence and the gradual exchange of indolent for active habits. These are easy cases to deal with.

Again, young persons are the subjects of it, but they are often pale and thin and dyspeptic and very sensitive, and inactive from mere debility and nervousness. In them the excessive action of the heart cannot be ascribed precisely to any one thing. The stomach and the nerves and the blood itself are all disordered, and they all are sources from which injurious influences may spring up and travel to the heart; and they all have probably their share in producing the simulated hypertrophy. Being so produced, its cure can only be effected by varied methods of treatment and after a long time, and often not until the constitution has undergone some of those changes which belong to stated periods of life. These are by no means easy cases to deal with.

Again young persons are the subjects of it, but they are often neither florid nor pale, neither too full nor too empty of blood. They have no complaint that they can tell you of, and none that you can make out, except an inordinate impulse of the heart; an impulse great enough for any amount of hypertrophy, and constantly present, and admitting of severe aggravation, and ever attended with pain, while the sounds of the heart are still loud and clear, and the præcordial region is still duly resonant.

These cases are the most difficult of all to deal with. Yet their treatment seems theoretically to lie within a narrow compass. There are no ailments of other organs to set right with the hope that through them you may reach the ailment of the heart. The heart itself contains within itself the sole indication of its treatment. Abate its violent impulse and all will be well. But bleeding will not abate it. Neither will all the variety of anodynes and antispasmodics. Neither will digitalis. For digitalis cannot be given long enough and largely enough for any fair hope of it as a remedy, without fearful hazard of it as a poison. In truth I know no certain medicine and no certain plan of medical treatment that will abate this impulse. But still I know that the very worst of these cases may get well. I have seen some such and watched them for a time and then have lost sight of them, and cannot tell how they have ended. And some I have seen again after the lapse of years, and found them as bad as ever: and some I have found perfectly well. In these last cases then how has the cure been wrought? Why, it has not been wrought in the way, which would imply a gradual process of bringing down an overgrown structure to its natural size and dimensions. But it has been sudden and abrupt, without any strict use of appropriate means, and sometimes with an utter neglect of them.

I remember a most painfully interesting case of this sort in which a strong opinion was expressed by eminent physicians, that the heart was in a state of hypertrophy. With all humility I held and expressed a contrary opinion. The patient was a young man for whom great interest had been used to get a commission in the navy. The commission was at last obtained; and he was ordered to join his ship by a certain day. All his prospects in life were at stake. I fairly represented to his friends, that either he had a most formidable disease, or he had nothing at all. The hazard was run. He joined his ship, sailed immediately for Greece and lost his palpitation at the battle of Navarino.

But there is a treatment of real hypertrophy which now comes to be considered; a treatment not of cure but of mitigation and postponement, which has for its objects to make the present evils of the disease as tolerable as may be and to avert or to delay the still greater evils to which it naturally tends.

And bleeding is among the remedies, which we find ourselves called upon frequently to employ for these purposes. But the use of bleeding in hypertrophy is an affair of much more caution and delicacy than you would suppose. I have a general remark or two to make upon this point.

The forcible impulse of the heart and arteries, which characterises hypertrophy, is far greater than that which ever attends the most acute inflammation. Yet in hypertrophy the quantity of blood which we are commonly content to take is small, and in inflammation the quantity which we are often compelled to take is large. In the case of inflammation the extraordinary impulse of the heart and arteries is the representative of new and extraordinary actions in the whole living frame, and is itself a part of them, of an universal strife of blood-vessels and nerves, of fever and irritation, which are all engaged, in actuating, sustaining, and quickening the local disease. All these must be brought down, before the inflammation can be made to cease; and you can have no assurance that they *are* brought down until you have effectually reduced the extraordinary impulse of the heart and arteries. And a large loss of blood may be needed for that purpose. And when it is needed, there is otherwise no safety for the patient. But in the case of hypertrophy the extraordinary impulse of the heart and arteries is no representative of present movements and irritations, febrile and nervous, which are fatally at work in carrying on disease to a destructive event. It depends simply and exclusively upon a mere mechanical force of extraordinary power acting upon the circulation at its source. Therefore it would be in vain to think of altering it by any amount of blood-letting, however large. For the mechanical force, upon which it depends, is itself permanent and unalterable.

But blood-letting is nevertheless a remedy for hypertrophy of the heart. Yet, I repeat, cure is not its object, but the mitigation of present, and the postponement of coming evils. And so it has no stated and constant use against abiding and essential and unalterable symptoms, but an occasional use only against incidental emergencies as they arise; such as pains and spasms of the heart itself, dyspnœa, and coughs, and hæmorrhages, and vertigo, and torpor, and convulsions. It is for these, that bleeding in some mode or measure is frequently needed. It may be venæsection. And if so, to what amount? I really cannot tell. Even, if the particular case was now before me, I could not point to any indication which should guide you to take more or less blood. The pulse, I have shown, is no index at all. Therefore I can only say, that the abstraction of a moderate quantity usually answers every purpose of good, and that the abstraction of a large quantity incurs great hazard of mischief. If the incidental emergencies are capable at all of relief by venæsection, the relief will follow the loss of six or eight ounces at most, and often of much less. Therefore let six or eight ounces be the extreme quantity which is taken by way of experiment in any case, with which you have no previous acquaintance. In cases which you know, the measure of your bleeding to-day must be governed by what has been well borne and has done good heretofore. Experience of the particular case is never so much needed to enable you to do the right thing for incidental emergencies, as in this chronic organic unsoundness of the heart. The loss of a few ounces of blood from the arm, at intervals of some weeks or months, may be the supreme remedy by which you may meet all occasional emergencies, and may be the great safeguard of the patient's life for years.

But venæsection at all may be more than is needed. It is so in the majority of instances. Often, very often, have I seen, after a few ounces of blood have been drawn from a vein, and the præcordial anguish and dyspnœa and convulsive cough have been unmitigated in the smallest degree, that half a dozen leeches have swept them all away at once.

It deserves to be mentioned indeed, as a thing beyond all reasonable calculation, that a few leeches should be thus able to overpower the most tumultuous conflict of pain and dyspnœa and nervous alarm, which can be conceived. Yet they do effect all this so often and so completely, that I am accustomed to resort to them, in these perilous emergencies of hypertrophy of the heart, before any other method of taking blood. Unquestionably they succeed oftener in bringing relief than either venæsection or cupping.

In the long course of such an affection as hypertrophy of the heart, things to be feared, as well as things which actually occur, have their due weight in determining us both what to do and what to abstain from doing.

Now anæmia is an awful condition when it is added to hypertrophy of the heart, in whatever way it arises. And it may arise in the natural course of things slowly and gradually, from a defect or failure of the digestive and assimilative powers. Or it may arise abruptly and suddenly from over-bleeding. And no sooner does it take place, than the extreme evils of the disease rush in upon the patient at once, and life runs rapidly down to its close.

One might fancy, that in hypertrophy the very condition of the circulation was such, as would enable it to bear with impunity the withdrawal of the largest amount of its natural stimulus. One might fancy, that the heart's indomitable force of action would prevent or mitigate the evils of an impoverished and scanty blood. But it is not so. With the anæmia all the cellular structure and every internal cavity have been filled with serum in a few days. Or with the anæmia no serum has been effused, but the heart has beat more forcibly than ever, and the patient has been literally agonised and killed by the mere violence of its impulse.

The palpitation which springs from anæmia, when the heart is sound, how dreadful it sometimes is! The pain, the jar, and distraction of the brain seem too great to be borne. Yet they commonly are borne, and they cease at last, and the patient gets well. But much more dreadful is the palpitation which springs from anæmia, when the heart is in a state of hypertrophy. Then the pain, the jar, and distraction of the brain are multiplied tenfold and are intolerable. Delirium and convulsions arise, and death soon follows; while neither blood nor serum has escaped from the blood-vessels, which could be considered as the immediate cause of death.

Beware then, in the management of hypertrophy of the heart, beware above all things, of bleeding your patients into paleness and poverty of blood.

But in hypertrophy of the heart there are other methods of compassing all possible ends within the reach of medical treatment, besides venæsection and cupping and leeches. In many a case no bleeding whatever has been employed from first to last, and yet all the relief and mitigation, that could be fairly expected, have been obtained. These other methods, however, have their application to other forms of disorganisation and to their pathological consequences, as well as to hypertrophy, and therefore they will be more conveniently considered in another place.

You might think perhaps that this hypertrophy of the heart, which is independent of valvular injury, provided it have not reached an extreme degree, would be a very manageable affection; manageable (I mean) not as to its cure, but as to the mitigation and postponement of evils belonging to it. Yet what is the fact? Why, that the best treatment in cases, which give (as far as we see) the fairest promise of success, is very apt to fail.

In some cases indeed no further evils arise, than such as from necessity must be where hypertrophy exists. For years there is still no mischief apparent except in the heart. And this makes no progress. It spins upon itself and evolves nothing beyond itself, neither dropsy nor hæmorrhage nor any of those secondary diseases of lungs, or brain, or liver, which are its looked-for consequences.—But these cases are the few.

In other cases, and these not the few, hypertrophy is hardly known to exist, or is thought to be yet at its commencement, when its ultimate evils begin prematurely to show themselves. Dropsies, congestions and hæmorrhages; cerebral, pulmonary and hepatic disorders arise and increase and admit of little mitigation, and death arrives far sooner than, regarding the heart as the chief and sole centre of mischief, we should have thought possible.

But after death dissection discloses the secret why our remedies have failed, and why the ultimate evils (as they seemed) of hypertrophy of the heart were so speedy to appear, and so unmitigable and so rapidly fatal. In truth the dropsies, the congestions, or the hæmorrhages, or the diseases, functional or structural, of brain, lungs, or liver were not, as they seemed, the effects solely of the hypertrophied heart. But these and the hypertrophied heart itself were secondary to something, which preceded them all, and was the cause of them all, viz. disease pervading the whole arterial system. The internal lining of the arteries, to their third and fourth ramifications and even their minuter branches is found puckered and shrivelled and roughened with deposits of atheroma and cartilage and earthy matter.

By such disease their elasticity is destroyed, or their natural calibre is altered; and this is especially observable in the aorta, which has sometimes undergone abrupt contractions or large dilatations between its origin and its arch or somewhere in its course through the chest.

In the records of my early hospital practice I find numerous instances, in which a *moderate* hypertrophy was the only apparent cause of numerous accompanying conditions of disease. And yet it seemed hardly capable of producing them. But still this hypertrophy and these its supposed consequences would admit of no mitigation and postponement.

Death took place, and *that* was then disclosed, which in these days would not escape detection during life, viz. granular disease of the kidneys.

What exact relation such disease of the kidneys bears to hypertrophy of the heart, we do not know even yet. But the two are too often coincident in the same subjects for them not to bear some, and that a very important, relation to each other.

LECTURE XXXII.

TREATMENT OF ATROPHY OF THE HEART—OF SOFTENING—OF DILATATION.—MEASURE OF ITS EXPECTED BENEFIT IN EACH.

ATROPHY of the heart, or attenuation of its muscular substance, is the form of disease which is naturally opposed to hypertrophy. Now of this atrophy, I doubt whether it can ever be made a distinct object of medical treatment *respective to cure.* I doubt whether the heart, having suffered such loss of substance from special disease of its own, can ever be made to recover it again by help of medicine.

When owing to defect of nourishment, from fever, or from disease in particular organs, or from accident, the whole body becomes weak and attenuated, the heart may perhaps (I am not sure of the fact), share the general disorder and become weak and attenuated also. And when the whole body, owing to better nourishment, becomes robust and lusty again, the heart may perhaps (I am not sure that it does) recover its natural strength and substance.

But all this, although it may originally spring from disease, yet, as far as the heart is concerned, has to do, not with disease, but with degrees of health. The full energies of health decline, and the heart suffers; the full energies of health revive and the heart is re-invigorated.

As to attenuation of the heart, when it is a special disease of the organ itself, I cannot flatter myself that I ever cured it even in its simplest form. The complex form in which it commonly appears may be safely pronounced incurable. The heart which is attenuated is commonly softened, and the heart which is attenuated and softened has commonly one, or both, of its ventricles dilated.

Softening of the heart may be looked upon as reparable or irreparable according to the conditions which have preceded it and conduced to it, and which still accompany it.

We will first consider it as a reparable disease.

There is a softening of the heart, which belongs to fevers of a typhoid type, when the whole mass of blood becomes loose and black and incoagulable, as if some foreign ingredient or some new force had operated upon it so as to change its chemical affinities and destroy for the time its natural properties as blood. Now this softening is reparable, though it is not always repaired.

When in fevers the skin becomes dusky, and the impulse of the heart fails and fails, until it can be *felt* no more; and the systolic sound of the heart fails and fails until it can be *heard* no more; and death follows, and after death the heart is found to yield and fall in pieces under pressure of the fingers; then surely we cannot be wrong in ascribing to the softened heart a large share in procuring the fatal result.

Again in fevers when the skin is dusky, and the impulse and systolic sound of the heart both fail, and death is imminent and threatening, and yet under the seasonable use of wine and stimulants the skin brightens and the heart is again felt and heard, and with its returning impulse and sound all inauspicious symptoms are gradually cleared up and recovery is finally complete, then surely we cannot be wrong in believing, first that the heart had been softened, and had afterwards recovered its natural texture and power, and secondly, that this recovery of its natural texture and power was mainly instrumental in saving life.

This softening of the heart in fevers is no new fact. But the knowledge of the precise auscultatory signs which denote its softening, and of the precise auscultatory signs which denote its recovery, this indeed is new knowledge, and we owe it to Dr. Stokes of Dublin. And further the detection, in these same auscultatory signs of one precise and plain *indication* to guide us in a most difficult point of medical practice, viz. the administration of stimulants in fever, this too is new, and this too we owe to the same sagacious physician. Whoever discovers a single new indication of treatment, which shall prove just and true and comprehensive, does a better service to mankind than if he found out twenty new remedies.

From what I have seen I am convinced, that this softening of the heart, by corruption of the blood in fevers, is often a very rapid process and never a very slow one. And I am also convinced that the recovery of the heart (when it does recover), by restitution of the blood, is often a very rapid process and never a very slow one. The blood is soon changed *from* its healthy state, and soon changed back again *to* it. The process seems more chemical than vital from its mere rapidity.

Now, as to treatment, it should seem that whatever had power to restore its healthy quality to the blood would be the remedy most suitable to recover the heart from its softened condition; and theoretically one would look to chemistry for it. But chemistry has no such remedy to offer us; and so we are left to make the best of our mere experience and to sustain the nervous system and the movements of the heart by simple stimulation, while nature transacts the business of reparation in her own way. Our remedies have no other purpose, and probably have no other effect, than to keep up a little life until the blood is able spontaneously to restore itself, and by consequence to restore the heart, and whatever other organs may have suffered the like detriment with it, to the conditions of health.

There is also a softening of the heart, which belongs to certain diseases of a chronic kind characterised by an unhealthy state of the blood: such as scurvy and chlorotic anæmia. When people die of scurvy the muscular structure of various organs throughout the body is found loose and soddened and without its natural cohesion, and of the heart among the rest. And when they die of chlorotic anæmia, internal parts are not only found as bloodless as the surface, but also loose of texture. Such is the condition of muscles, and among the rest of the heart.

But recovery is infinitely the more frequent event of these diseases: even full and complete recovery, when it is impossible to doubt that the heart and whatever other parts have suffered detriment are restored to their natural integrity.

Now in these cases the softened heart has no special remedy. Its treatment is merged in the treatment of the scurvy or the anæmia. Cure the one by lemon juice and the other by steel, and you cannot help but cure the softened heart.

Be it remembered, that the softening of the heart, which belongs either to fever, or to scurvy, or to chlorotic anæmia, is part only of a great constitutional disease, and that it partakes of the same nature and admits the same influences for good or for evil, and the same means of cure.

This, then, is a sure fact of pathology, and very important to know, that the heart, whether its softened state has been of very short duration as in fevers, or of very long duration as in scurvy and anæmia, is capable of regaining the original firmness and consistence of its healthy structure, when the fever or scurvy or anæmia is past.

But though this be possible in the nature of things, is it commonly the actual event? Indeed I believe it is. Yet it is otherwise stated in books; where the softening of the heart begun in fevers is looked upon (I find) as likely ever afterwards to remain and to terminate in the worst pathological consequences. That this has happened, I must admit. For one or two such cases have been reported to me upon authority which I can entirely trust. But I have no record of any case in my possession, and I have no remembrance of any, where a chronic disease of the heart, which had softening for its main characteristic, could be fairly traced back to a certain period, when the patient suffered fever.

So too the softening of the heart begun in scurvy and anæmia is spoken of (I find) as apt to be permanent and lead to fatal results. Now I have no right to be absolutely incredulous about the possibility of things which I have never seen. Nor am I. Yet I may well doubt their *frequent* occurrence, when, being both in the way of them and upon the look-out for them, I have never yet met with them at all.

From what I have seen I suspect it to be an indispensable condition to the possibility of cure in these cases that the disease of the heart should be a simple softening of its muscular structure and nothing more.

But we have now to consider the softening of the heart as an irreparable disease. Yet as such it is still the same disease anatomically, but another disease in all its pathological relations; and hence it comes to be irreparable.

When it is a part of fever or of scurvy or of anæmia, *its* treatment is merged in *their* treatment, and *it* is reparable because *they* are reparable.

In the majority of cases, however, softening of the heart is not found coincident in its origin either with these, or with any other constitutional maladies of a like character, namely, with such as have a stated course to run, or are spontaneously curable, or curable by help of medicine. But it is secret in its beginning and secret still in its stages and periods, until at last we find it one among many diseases of other parts which have been as covert in their origin and growth as itself. Of it and of them it is now in vain to enquire which preceded and which followed; and, looking upon them pathologically, we cannot tell whether to reckon each as several or all as one disease.

The patients are in the decline of life, or they have forestalled the season of old age by intemperate habits. Their nervous system may be shattered: their arteries may have undergone extensive changes of structure: their livers may be enlarged, their kidneys may be granulated. All of these forms of disease may be, and some of them are sure to be, conjoined with softening of the heart, before it comes to be known and to be treated.

And, further, before it comes to be known and to be treated, the softening of the heart is already a part only of a complex disease in the organ itself. The very same tissue, the muscular tissue, has undergone other disorganisation besides softening. Either it is augmented in bulk and hypertrophied, or it is diminished in bulk and attenuated. This chronic softening of the heart is (as far as I know) always united either with hypertrophy or attenuation.

Further, a heart softened and hypertrophied, or a heart softened and attenuated, has (as far as I know) always one or both of its ventricles dilated.

Thus this chronic softening is a part of a threefold disorganisation of the heart. And, if each part separately offers (as it does) but a slender hope of cure, the complex of the three may be set down as incurable. No bark or steel or tonic remedy can now reach the heart and strengthen it. No mercury or iodine or alterative remedy can now reach the heart and change it to its natural state again.

Is dilatation of the heart *per se* a reparable disease? We are encouraged to believe that it is upon good authority. But I can really find no satisfactory evidence of the fact. I even doubt whether there be any such thing as a dilatation of the heart, *per se;* whether either ventricle ever have a *constantly* enlarged capacity while its walls are of a perfectly normal and healthy structure.

No doubt there is a temporary yielding of the ventricles in obedience to a temporary necessity. This is seen especially on the right side of the heart, when blood is detained within it from obstruction to its passage through the lungs; but as soon as the pulmonary circulation is set free, the heart, being no longer surcharged with blood, returns upon itself and the ventricle resumes its normal capacity. But this is *distention,* not dilatation. And it is for the very purpose of enabling it to bear this distention and to recover from it, that the heart is endowed with its great physical property of *elasticity.*

Now I understand this to be the distinction between distention and dilatation. The capacity of the ventricle may be indeed augmented equally in both; but in the one the elastic property of the heart remains, and is ready to bring back its capacity to what it was and what it ought to be, when the extraordinary pressure from within shall cease; while in the other the elastic property is lost, and so the power is wanting to bring back its capacity to what it was and what it ought to be.

But how is this elastic property lost? Is it not because the muscular structure in which it resides has lost its perfect organisation? When the heart is dilated, it is (I believe) always at the same time either hypertrophied or attenuated or softened. And it *is* dilated, *because* it is hypertrophied or attenuated or softened.

Dilatation, then, can never in itself become the sole or direct object of medical treatment, inasmuch as it has no manner of existence except incidentally to certain conditions of the solid structure which bounds the cavities of the heart. You cannot reach it remedially but through them. You can cure a dilatation of the heart only by first curing an hypertrophy, an attenuation, or a softening of heart. How far these are curable we have already considered.

Thus I have taken several of the most important diseases of the heart which pathology has described and distinguished by names, and have endeavoured to estimate, under the guidance of such experience as I possess, how far, either singly or in their more accustomed combinations, they are amenable to medical treatment. And the result is, that in my belief a too flattering representation has been made by writers of what medicine is able to effect respective *to their cure.*

Physicians do well to follow in the track of the pathologist. Our *treatment* of disease should strive to keep pace, if it can, with our *knowledge* of disease: but we must not be disappointed when it cannot. In a hundred instances we must be content to know what is wrong without being able to set it right.

But diseases should not be too hastily pronounced irremediable. We have indeed much knowledge from experience, but not a complete knowledge, of what is remediable and what is not, in all cases.

Diseases are irremediable in two senses; either nature wants the power, or we want the remedy. The essential work, or operative process of reparation, belongs to nature. Medicine only furnishes inducements or removes impediments. Failure may be on the part of one or the other, or of both.

Now after a certain amount of detriment done to an organ by disease, we are as sure from experience, that restoration to its integrity of structure is impossible, employ what remedy we will, as we are that an amputated limb will never grow again.

Again, there are diseases, in which we are sure on the one hand that reparation is within the power of nature; yet we are sure on the other that, without the seasonable aid of medicine there will be no reparation in fact. Such are acute inflammations.

Again, there are diseases, in which there is no settled opinion among physicians either as to the power of nature to effect their reparation or the power of medicine to further it. Such are hypertrophy, and atrophy and softening and dilatation of the heart. Nor ought this to excite surprise. The diseases themselves are of very difficult investigation, and so are all points, both pathological and practical, connected with them. No wonder then, that upon the great point of their curability medical men, whose experience is equal, should come to different conclusions according as their minds are wont to be satisfied with greater or less degrees of evidence, or their tempers are more or less sanguine, or their opinions apt to be more or less indulgent to their wishes.

But medicine contemplates other objects besides cure. It aims still to postpone the progress of incurable disease and to put off its evil consequences; and, when they can be no longer postponed, it seeks to render them more tolerable.

When the heart has become a spoiled organ, it is still a vital organ. Unsound as it is, all parts of the body still draw the pabulum of their life and their functions from it. But their life and their functions partake henceforward of the heart's imperfections.

There is a mischief done to the heart which cannot be undone, and an unsound heart cannot be made to do the office of a sound one. But the unsound heart with even its imperfect office, being essential to life, must yet have our care to avert from it all possible obstacles and hindrances, in order that it may not entirely fail. But with this view other organs and systems of organs demand our attention more than the heart itself in its own proper seat. Medicine is called upon to give aid and support to every feeble and failing function throughout the body, and so to prolong a precarious existence by lightening the burden of the heart. But this opens to us a new field of enquiry.

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LECTURE XXXIII.

EFFECTS OF AN UNSOUND HEART UPON THE GENERAL VASCULAR SYSTEM, ACCORDING TO ITS DIFFERENT FORMS OF UNSOUNDNESS.—EFFECTS UPON THE VEINS.—EFFECTS UPON THE ARTERIES.

THUS far in one sense the heart has been taken as the centre of disease. The actuating causes having their origin elsewhere, have been followed in their bent and tendency *towards* the heart, and the disease itself has been sought and found and treated *in* the heart.

But now the heart is to be taken as the centre of disease in another sense, namely as its point of departure. The movement of the actuating causes is to be followed in an opposite direction, proceeding *from* the heart instead of tending *towards* it, and the disease itself is to be sought and found and treated in other parts.

Intermediate between the heart and all structures and organs throughout the body, and carrying the pabulum of life through a thousand channels, is the vascular system, carrying life, and healthy life, as far as it depends upon the heart, when the heart is sound, and still carrying life but unhealthy life, when the heart is unsound.

From the unsound heart a fountain of evil is opened which reaches to all parts, and actual disease may be ultimately induced upon all. But the intermediate vascular system may be expected to give tokens antecedently, in the way of preparation of what is going to take place. What sort of preparation this is, which is carried on within the veins and arteries, for diseases to be developed anywhere or everywhere, becomes an interesting enquiry.

To begin with the veins. The plainest and most palpable effects of an unsound heart upon the circulation in the veins are denoted by their distended and overloaded state; and not by their distended and overloaded state only, but their visible pulsation and quivering. The first denotes an impediment to the transmission of blood onwards, the latter denotes its regurgitation backwards.

Simple distention of the veins is often visible in every part of the body. Pulsation or quivering seldom reaches beyond the jugulars; but I have seen it extend as far as the large superficial veins of the hands and feet. The jugular veins, when their pulsation is constant and very evident, have generally undergone some change in their natural capacity. They stand out from the neck like large round cords, equal almost in size to the little finger. When their motion is a mere quivering and is not constantly present, they do not always appear larger than natural.

To come at the real origin of any symptom, it is necessary to ascertain what is the simplest form of disease with which it is apt to be associated. Now I had found the symptom in question, viz. the distended and pulsating jugular vein, associated with such various and complex forms of unsoundness in the heart, that for a long time I had no notion to which of them it expressly belonged; I had observed it with hypertrophy and attenuation, with dilatation of the various cavities, and with stricture at the various orifices. At length I met with it, where the right auricle and ventricle were dilated while every other part of the organ preserved its natural structure and capacity. This, as far as I know, is the simplest form of unsoundness of the heart with which it is ever associated. This, therefore, I must believe to be its real efficient cause. And from this it may still derive its origin, even when it is found associated with more complex disorganisation of the heart, of which dilatation of the right auricle and ventricle forms only a part.

Now one effect of dilatation of the right auricle and ventricle obviously must be, that the aperture of communication between them should become wider, and that the valvular apparatus, which naturally does no more than close it, should now be rendered inadequate to the purpose. Hence, every time the ventricle contracts, blood is impelled backwards as well as forwards. And the veins near the heart easily admit its regurgitation.

But still one has seen a pulsation, a temporary pulsation, at least, of the jugular veins, under circumstances where it could not be supposed that the right side of the heart was otherwise than sound of structure. In a severe paroxysm of asthma one has seen it, and both have ceased together.

Yet how can there be even a temporary pulsation of the jugular veins, implying the regurgitation of blood within them, while the right side of the heart is sound and the tricuspid valve is healthy and capable of fulfilling its supposed functions?

Subsequent experiment has, I believe, confirmed the important fact which was first pointed out by Mr. Hunter, viz. that the valves on the right side of the heart do not, in their healthy state, perform the office of barriers to the regurgitation of blood as perfectly as those on the left. If the pulmonary artery be injected towards the heart, the semilunar valve does not entirely prevent the injection from passing into the right ventricle; if the right ventricle be injected towards the auricle the tricuspid valve does not altogether exclude it from the vena cava and the jugular veins.*

Now upon reflection it must appear, that this natural attribute (for such it is) of the valves on the right side of the heart, whereby in truth they fall short of the perfection of valves, not only serves to mitigate the urgency of disease, but is an admirable provision coming into frequent exercise in health, and absolutely required to prevent the gravest injuries and even to guard the continuance of life itself.

The whole blood of the body must needs pass through the lungs where it is liable to suffer impediments daily and hourly. Perfect respiration is necessary to perfect freedom of the pulmonary circulation. But to how many checks and hindrances is the respiration obnoxious, among other causes, from great bodily exertion, from efforts of voice, and from many mental emotions? And all such checks and hindrances are felt by the pulmonary circulation according to their degree; and then nature is called upon to bring into play her own express provision for withholding for a time from the lungs that portion of blood which they cannot bear, and (if need be) for throwing it back upon the veins. Unquestionably one part of this provision is the apparatus at the entrance of the pulmonary artery and between the right ventricle and auricle. It is even its imperfection, considered as valves and compared in its office as such with the apparatus holding the same relative situations on the left side of the heart, but its admirable perfection in its own office and use, which gives this wondrous aptitude to sustain, correct and compensate the accidental checks and hindrances of the pulmonary circulation.

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* Hunter on the Vascular System, cap. vii.

If the valves on the right side of the heart were, like those on the left, absolute and unyielding barriers to the return of blood, we must die of every exertion or accident which could impede the respiration even for a short time. If the blood must be forced forwards instantly and constantly, column by column, as it arrives at the heart, the blood-vessels of the lungs must be instantly and constantly ready to receive it; otherwise they must suffer rupture, and let loose a flood within them producing death by pulmonary apoplexy. But nature has been provident in guarding against such fatal necessities. The vessels of the lungs cannot indeed at all times receive the same quantity of blood, for they are not at all times equally free. Hence a provision was necessary and a provision was made, which, in accommodation to their varying capacities, allows some portion of the blood to linger in the right side of the heart, and, if need be, to fall back into the veins, until the lungs recover their ability to transmit the whole.

There is then an extraordinary mode of action, which the right side of the heart in its *healthy* state is capable of exercising for the regurgitation of blood into the veins. And this regurgitation may be enough to produce distention and visible pulsation of those nearest the heart. But the pulsation of the jugular veins so produced is merely temporary, and must be carefully distinguished from that which is permanent. For it is the permanent, which is the symptom of an unsound heart. The heart, having its right cavities largely dilated, cannot help producing permanently that distention and pulsation of the jugular veins, which it produces temporarily only and by an extraordinary mode of action in its state of health.

The same case in the course of its progress is sometimes found to exemplify both of these conditions. A man is the subject of asthma; and in the severer paroxysms of his disorder the jugular veins are observed to stand out and to pulsate, but, as soon as the attack is over, they subside and resume their natural state. Thus far the right side of the heart, its structure being unimpaired, admits the regurgitation of blood for the relief of the lungs as long as it is needed and no longer. In process of time his asthmatic paroxysms become more frequent, and strange to say, in the intervals between them the jugular veins do not subside and cease to pulsate. There may indeed be some degree of constant dyspnœa; but the venous distention and pulsation are greater than the apparent impediment to the passage of blood through the lungs can explain. They are greater now that they have become permanent, than ever they were during the severest asthmatic paroxysms. In truth the heart has undergone that change of structure which an asthmatic state of the lungs is calculated to produce. Its right cavities are permanently dilated and have produced permanent distention and pulsation of the jugular veins, as a natural and necessary consequence.

Further, in regard to this state of the jugular veins, it is worthy of notice that it is apt to arise at different periods of time in different cases, and that, taken as a symptom of an unsound heart, it is apt to bear not always the same relation to its other symptoms. It often shows itself at an early period and is prominent from first to last. And again it often shows itself late and is superadded to other unequivocal symptoms which have already long existed. Herein it exhibits a striking correspondence with the peculiar change of structure from which it takes its origin. For dilatation of the right cavities is often the heart's sole or principal form of disorganisation from first to last; and again it is often consequential to other forms of disorganisation which preceded it.

Where distention and pulsation of the jugular veins have been among the earliest symptoms, and have continued constant and prominent to the end, it may be inferred that the disorganisation began on the right side of the heart. Where they have been among the latter symptoms, it may be inferred that the disorganisation began in some other part of the heart and subsequently reached the right side. And the eventual appearance of distention and pulsation in the veins may then be taken to mark the period at which the right auricle and ventricle became dilated.

Thus, from conditions apparent in the largest and nearest veins to the heart, we can measure the degrees of impediment raised by the heart's unsoundness to its returning blood. And experience has learnt to which form of unsoundness the greatest impediment belongs.

But the veins nearest the heart are a part only of the entire venous system, the larger channels into which smaller ones without number empty themselves. The larger therefore cannot be obstructed and the smaller remain free. And so it is that when the jugular veins are full and pulsating, the whole surface of the body becomes dusky and the lips and eyelids livid and swollen.

Such is the influence of an unsound heart upon the circulation of blood in the veins, and such is the particular form of unsoundness, which makes itself especially felt in this part of the vascular system.

Here, then, behold the preparation within the veins for diseases afterwards to be developed anywhere or everywhere, of what nature it is, and how it is carried on. Hence come congestions, effusions, hæmorrhages, inflammations.

Let us now turn to the arteries.

The plainest and most palpable effects of an unsound heart upon the circulation in the arteries are denoted by their excessive, or by their defective, or by their irregular, impulse. Not that each of these may not consist with the heart's perfect freedom from organic injury. The sound heart is subject to hurtful influences out of itself; and these influences it often feels and obeys and resents as if the injury were all its own, sound as it is. Its contractions may have much more or much less than their natural force, or they may lose their natural rhythm; and so the pulse become very strong or very feeble, or very irregular.

But then the strong or the feeble or the irregular pulse need not be (experience tells us) of any formidable account, as long as the heart is sound. It may come and go, or it may continue long or continue always, and yet have no present or prospective evils beyond itself naturally and necessarily belonging to it. But with the excessive or defective or irregular impulse of the arteries, when it proceeds from an abiding unsoundness of the heart, it is far otherwise. Then it is always the prelude or accompaniment of some deeper and more vital derangements of the entire arterial circulation.

It is needless here to stop and discuss the signs, which are to determine when an abnormal motion of the arteries is derived from unsoundness of the heart, and when it is not. The diagnosis lies in a small compass and is seldom difficult. It turns altogether upon auscultation, when we apply it to the heart, finding something, or finding nothing, organically wrong there. But something organically wrong being found, its nature and its seat next require to be learnt, for the sake of better understanding how the derangements of the arterial circulation have arisen out of it, and how they are kept up by it from day to day, and to what they ultimately tend; and all this for the sake also of better understanding how they are to be treated.

Now as to its seat; in order to make itself felt first and especially in the arteries, the heart's unsoundness must be of the left side. And as to its nature; when the impulse of the arteries is permanently greater than natural, it must proceed from some form of unsoundness which gives the heart *a real excess* of organic power; and not only so, but which induces and actuates it to be constantly using this excess of power which it has. Such is hypertrophy of the left ventricle. And when the impulse of the arteries is permanently less than natural, it must proceed from some form of unsoundness which entails upon the heart *a real defect* of organic power and constantly keeps down its actions to this small measure of power which it possesses. Such is softening and such is attenuation. And when the impulse of the arteries is irregular, it must proceed either from some form of unsoundness which entails upon the heart a simple defect of organic power, or from some which raises a mechanical impediment to the current of blood. It must come either from softening or attenuation. Or it must come from valvular injury.

These, I am well aware, are not axioms; and I do not pretend to affirm them as such. But they are facts so far generally true, as to contain something of a principle, which may be of use in our further consideration of the subject.

Well, then, an overstrong heart produces an overstrong pulse, and a weak heart produces a weak pulse; and a weak heart or a heart mechanically obstructed produces an irregular pulse. These things are easily stated, and in themselves are hardly worth dwelling upon. But the deeper and more vital derangements of the arterial circulation, which accompany them, are of chief concern to us as physicians.

While the left ventricle preserves its natural size and structure, it distributes its blood to all parts with a force and in a quantity proportionate to their several needs. It holds a salutary and independent dominion over all, and yet allows to the extreme blood-vessels of each part their independent uses and functions.

But the left ventricle in a state of hypertrophy impels its blood to all parts with a force and in a quantity greater than they can bear. It now becomes an overmatch for the circulation. It does not so much preside as tyrannise over it. Its power is painfully present everywhere. It pushes the globules further into the extreme branches than they would naturally reach, and so reddens surfaces which are naturally pale; and to parts, which are naturally red, as muscle, it imparts a more conspicuous redness. It encroaches upon the independent functions of the capillaries until finally it abolishes them. Hence congestions and dropsies and hæmorrhages, and diseases, of whatever name and whatever part, which result from repletion of the blood-vessels and effusion of their contents.

Again, the left ventricle in a state of attenuation or softening impels its blood to all parts with a less force and in a less quantity than they need. It can now hardly be said to preside over the circulation. Hardly is its power sensibly present anywhere. The blood, which leaves it, seems to make its own way, as it can, by an unequal and ill-sustained current throughout the body. And so parts become pale and dusky and mottled and cold for want of the due measure of blood within them or for want of sufficient vital briskness in its course. Hence there result diseases of the same name at least as those which come from hypertrophy, though not entirely of the same nature. Passive, instead of active, congestions and effusions; passive instead of active, hæmorrhages and inflammations.

Again valvular injury, while it renders the pulse irregular, delays and obstructs the course of the blood through the arteries in various measures according to *its* degree. And then these delays and obstructions according to *their* degrees bring a greater and greater hindrance, until finally they put a stop and a stand to all that blood and blood-vessels have to do with the functions of particular organs. And thus the ultimate effects of valvular injury are the same with those of hypertrophy, and those of softening and attenuation; viz. congestions and effusions, hæmorrhages and inflammations.

Here then is a sketch of what unsoundness of the left side of the heart, according to its several forms, is calculated to bring upon the arterial circulation and, through it, upon the constitution at large. And it is, I believe, a true sketch, as far as it goes. For just as simple and as plain as it is here represented, is the matter *sometimes* found to be in practice. And it is well to begin with what is simplest and plainest.

It is *sometimes* (I say) found to be so; but neither always nor very often; nor, when it is so, is it found so to continue very long. Therefore, if I were to leave the matter here, unsoundness of the heart and its effects, immediate and remote, would seem, from my representation, a much simpler and plainer piece of pathology than it really is.

But in the first place, these several forms of unsoundness belonging to the left side of the heart, need not occur singly and separately. Nor do they; neither hypertrophy alone, or attenuation alone, or softening alone, or valvular injury alone, as if one naturally excluded another. On the contrary, they are almost all capable of entering into combinations with one another, and are continually found together. Hypertrophy indeed cannot co-exist with attenuation; for the same thing cannot at once be thick and thin. But hypertrophy is compatible with softening, and softening with attenuation, and valvular injury is compatible with them all, and, accordingly, as far as they are all compatible, so far they often co-exist. In fact, they naturally grow up together, or they naturally induce one another, and thus, except during the actual progress of acute disease or the earliest stages of chronic, it is a rare thing to find the unsoundness of the heart limited to one particular structure or to one particular form.

But do not these strange mixtures of disease produce strange mixtures of symptoms? And are not the modes, in which especially the arterial circulation is effected, so complicated as to defy the possibility of reducing them to any definite order?

And is not an extreme difficulty thus thrown in the way of our present purpose; the purpose, namely, of gaining an insight into the operations then at work throughout the body, which are preparatory to diseases of fatal tendency yet to come?

Now the results of experience carefully considered will show, I think, that there is in fact less perplexity belonging to the matter, than would at first sight appear.

Two forms of unsoundness, which are themselves different in kind, may produce the same effect upon the circulation. And when such forms are combined, there is found indeed a complex disease of the heart: yet an effect upon the circulation proceeds from both, altogether as simple and entirely of one kind as when each form exists alone, only greater in degree.

Attenuation of the left ventricle is one form of unsoundness, and softening of the left ventricle is another. Attenuation produces feebleness of the pulse, and softening does the same. And when they occur together, their combination serves but to give the pulse a greater feebleness and to bring on those deeper derangements of the arterial circulation, which are common to both, sooner, and to impress them with a more decided character.

Here then there are no discordant results to reconcile. Two causes are found operating in the same direction; and the effect of one is simply multiplied by the effect of the other.

Again, there are several forms of unsoundness in the heart which may be said rather *to tend towards* a certain effect upon the arterial circulation than necessarily to produce it. They must reach a certain amount before the effect is sure to follow. Yet where each separately would not be enough to produce it, from their combination it would arise inevitably. Attenuation of the left ventricle, softening of the left ventricle, injury of the valves either at its entrance or its exit, all tend to interrupt its rhythmical action and to make the pulse irregular. But the heart does not lose its rhythm and the pulse its regularity from every attenuation, or from every softening of the ventricle, or from every injury of the mitral or aortic valve. The attenuation or the softening or the valvular injury must be extreme for either of them singly to produce this effect upon the heart and arteries. But the combination of all three, though each were but of small amount, would produce it inevitably.

Here, too, there are no discordant results to reconcile.

In speaking of distinct forms of unsoundness in the heart, and in endeavouring to appreciate their separate influence upon the arterial circulation, we passed by all mention of dilatation of the left ventricle.

The truth is, that experience hardly recognises it as a distinct form of unsoundness, and can take no sure measure of the separate influence which belongs to it. But there is no form with which it is not found in alliance, and the part which it then acts in combination, is not difficult to interpret.

Whether the left ventricle gain or lose in muscular substance or gain or lose in muscular consistence, it is apt at the same time to acquire an augmentation of its capacity. Now when this is the case, what effect upon the circulation within the arteries can be attributed to the dilatation beyond what would result from the hypertrophy alone, or from the attenuation alone or the softening alone, in the several cases? I believe nothing different in *kind* but something different in *degree*, whether of more or less. Dilatation further augments the impulse of an hypertrophied heart, which is already excessive. And dilatation further diminishes the impulse of an attenuated or a softened heart, which is already defective.

When the impulse of the heart is thus augmented both in proportion to its hypertrophy and in proportion to its dilatation, and each is great in degree, results of *one* kind are indeed fearfully displayed. The hypertrophied heart, constantly receiving a larger quantity of blood into a more capacious ventricle, constantly feels a greater stimulus, and, being ever ready with full power to answer it, it *does* answer it by a never-failing, even by a terrible reaction. Throwing forth more blood and moving it column by column with a stronger current, it fills and distends the arteries even to the peril of rupture and overflow, and hurries on all its fatal consequences to an earlier and surer consummation.

Again, when the impulse of the heart is diminished both in proportion to its attenuation or its softening, and in proportion to its dilatation, and both are great in degree, results of *another* kind follow, and bear a very marked and exaggerated character. The attenuated or softened heart receiving a larger quantity of blood into a more capacious ventricle may feel a greater stimulus, but it certainly has not the power to answer it; and answer it it does not by any adequate reaction. It conveys not more but less blood into the arteries. It cannot cast forth what it contains. And what remains behind, remains to stagnate and regurgitate, distending the heart and baffling its motions, oppressing the lungs and baffling the respiration or bringing their vital functions to a sudden stop.

But two forms of unsoundness in the heart, which are themselves different in kind, may produce different effects upon the arterial circulation. And, when they co-exist in the same heart, one would expect to find partly one effect and partly another, and that thus a complication of opposites would result, which would be quite unintelligible. Yet this need not be the case. One effect may be taken up by, and merged and lost, in the other; and, while the unsoundness of the heart is of two kinds, it may be felt by the arterial circulation as if it were of one kind and one only.

Hypertrophy of the left ventricle gives an extreme force, and softening of the left ventricle an extreme feebleness, to the pulse. But the hypertrophied structure may become softened, and the two conditions of hypertrophy and softening afterwards subsist together. Yet there is no mixture of the effects of each upon the circulation. The extreme force, which belongs to the one, gives place to the extreme feebleness which belongs to the other; and all the other deeper and more vital derangements of the circulation will thenceforth change their character, and be altogether as if no hypertrophy existed in the heart but softening alone.

When softening is thus superadded to hypertrophy, and when the effects characteristic of the first supersede the effects characteristic of the second, then the change which the patient experiences is upon the whole greatly, very greatly for the worse. The change of strength for weakness is always for the worse. But the mixture of these two forms of unsoundness in the heart does, I believe, seldom occur, and hardly ever, when it does occur, is it clearly made out during the life of the patient. Indeed how is it possible that it should, when an entire order of symptoms, which should indicate one part of the complex affection, the hypertrophy, is utterly abolished?

There is however a mixture of two forms of unsoundness in the heart, which is very common. All physicians of hospitals are familiar with it from having examples of it constantly under their observation. It is the mixture of hypertrophy and valvular injury. Here the diagnostic signs of both remain, so that there can never be the least doubt of the existence of either. The impulse within the chest, constantly augmented in degree and in extent, denotes the hypertrophy. The endocardial murmur, constantly present, denotes the injury of the valves.

But, while the coincidence of the two is thus far without prejudice to the diagnostic signs of either, yet looking further to the actions of the heart itself, to the movements of the blood within the arteries, and to the deeper and more vital derangements, which naturally belong to each when they exist separately, we clearly discern the effects of the one wonderfully merged and lost in the effects of the other, now that they exist in combination; we see the effects of valvular injury merged and lost in those of hypertrophy.

To valvular injury naturally belong an irregular contraction of the ventricle and an irregular pulse, and obstructions and delays to the course of blood through the arteries in various measures according to its degree. To hypertrophy naturally belong an excessive force of contraction in the ventricle and an excessive impulse communicated to the current of blood in the arteries. And this force and impulse are naturally opposed to all that is irregular and eccentric in the action of the heart and arteries, and even counteractive of it, when it would otherwise arise. Thus they are counteractive of their irregular action, when it otherwise would arise from valvular injury.

Moreover this coincidence of hypertrophy of the left ventricle and of an injured valve exhibits the most beautiful example, in the whole range of pathology, of the checking, redressing, and compensating powers which nature possesses and uses in furtherance of the great ends of mitigating distress and of protracting life, when some important structure is damaged beyond the possibility of reparation.

In this coincidence there is nothing of accident; all is of design. The important structure, damaged beyond the possibility of reparation, is the valve. The unsoundness of the valve comes first, and then produces the hypertrophy, and produces with it the redress of its own injuries. While the valvular unsoundness is yet small, and still when it has become greater, and even still when it has become very great, the heart is often found from first to last maintaining its rhythm and the pulse its regularity. And no wonder. For it is accompanied at every stage of its increase by a proportionally increasing power of the ventricle.

A loud systolic endocardial murmur and an excessive impulse of the heart and a larger space of præcordial dulness than natural, these are the sure and authentic signs of an injured valve and hypertrophy of the left ventricle. Yet often and often are these found to co-exist, when the order and sequence of the heart's contractions and the beats of the pulse are perfectly regular and rhythmical. And further, with this certain evidence of an injured valve and of hypertrophy of the left ventricle, not only will the heart and the pulse beat regularly, but the blood will continue to be distributed freely and equably throughout the body. Often the complexion is still healthy, the lips florid and the body well nourished.

Here it is the hypertrophy, which is the safety of the patient and enables life to go on as it does. Take away the hypertrophy and leave the injured valve, and the patient would be in a far worse state than he now is: worse with half his disease than he now is with the whole of it. The pulse would begin to flutter, the complexion would become dusky and the lips blue, and the surface of the body mottled and patched in consequence of the blood being here and there unequally distributed or partially detained. The ventricle reduced to its common bulk would want the power needed to impel the blood steadily onwards against an extraordinary obstacle.

But let nothing that has been said be misinterpreted. Hypertrophy of the left ventricle is still a tremendous evil. Recollect its immediate effects upon the arterial circulation, which are preparatory to others more formidable and more fatal, ready to be developed in due season. And valvular injury too is still a tremendous evil. Recollect also its immediate and ultimate effects, which are alike formidable and fatal. True it is, that in the coincidence of the two, one is found to fulfil a salutary office respective to the other. But this is only for a time. The valvular injury and the mechanical impediment annexed to it may increase beyond the possibility of deriving relief from any compensating power whatever. And the hypertrophy too may so increase that the salutary office, which might belong to it in its lesser degree, is exchanged for an unmitigated and deadly mischief.

LECTURE XXXIV.

GENERAL VIEW OF THE SECONDARY DISEASES WHICH PROCEED FROM AN UNSOUND HEART, AND OF THEIR TREATMENT.—THEIR VAST PATHOLOGICAL RANGE.—CONGESTIONS.—EFFUSIONS.— HÆMORRHAGES.— INFLAMMATIONS.— INQUIRY INTO THE COMMON PRINCIPLES OF THEIR CURABILITY.—CURABLE IN A HIGHER AND A LOWER SENSE ACCORDING TO THE NATURE OF THEIR ACTUATING CAUSE.—AS THE RESULT OF AN UNSOUND HEART CURABLE ONLY IN A LOWER SENSE.—SUSPENSION.—ABATEMENT.—TEMPORARY REMOVAL POSSIBLE. —CONDITIONS LIMITING AND ENLARGING THE EXPECTATIONS OF MEDICINE IN DIFFERENT CASES.—FORM OF UNSOUNDNESS IN THE HEART ITSELF.—PRESENCE OR ABSENCE OF COINCIDENT DISEASE IN OTHER ORGANS.—THE NATURAL CONSTITUTION OF THE PATIENT, WHETHER HEALTHY, OR PLETHORIC, OR ANÆMIC.—THE PATIENT'S CONDITION IN LIFE.—THE TIME AT WHICH TREATMENT IS FIRST INSTITUTED.

CONGESTION, effusion, hæmorrhage, inflammation are terms used to express the elementary forms of disease which belong especially to blood and blood-vessels, and which, taken in all their bearings, comprise a very large portion of the entire domain of pathology and practice; a portion which has ever engaged the study of the best minds, since medicine began to be cultivated as a science.

What these forms of disease are essentially in themselves, and how blood and blood-vessels are engaged in producing them, also what are the preceding conditions which can be reasonably thought to stand to them in the relation of causes, whether predisposing or exciting, near or remote, within or without the body; upon all these important matters I must presume, that some sound knowledge is already possessed. For I cannot now enter upon them with a view to their explanation.

Only I would remark that, of the multitude of such matters worth knowing, there are some which are practically more desirable to be known. It is especially desirable, with a view to the best treatment of these diseases and with a view to the best results to be expected from their treatment, that we should be able, from among various preceding conditions, to choose and fix upon those which possess the real force of *actuating* causes in each particular case. For many causes may concur to produce one of them. Or a single cause may produce them all, together or in turn. And that single cause may be an unsound heart. Congestions and effusions and hæmorrhages and inflammations, in any or every part of the body, may be reckoned among the ultimate consequences of an unsound heart. Now the fact of their having an unsound heart for their actuating cause does not put them beyond the reach of medical treatment. Very far from it. But it assigns certain limits to what is to be expected from medicine. Our present object is to inquire what those limits are.

But first a little thought may be well bestowed upon the general subject of their curability under whatever circumstances they occur. Every one knows with what uncertainty they are found amenable to medicine, now easily, now scarcely, and now not at all; and it would be well, if we could, to come to some right notion, what it is that makes them so.

Our remedies, or (to speak more to the purpose) our methods of treatment for these affections, are chosen according to the objects we have in view. The affections themselves and their actuating causes may be both within our reach, and therefore both within our view in treating them. And then we seek a treatment which will compass both. We aim to get rid of present disease and to leave nothing in the constitution from which it can germinate afresh. This is cure in the highest sense. Or only the affections themselves may be within our reach, and their actuating causes may be beyond it. And then we seek a treatment which shall concern itself with the one, and stop short of all interference with the other. The best we aim at is to get rid of present disease, while we leave the patient just as likely to suffer it again at some future time, as he was at first. This, if it may be called cure at all, is cure in a much lower sense.

From malaria, from contagion, from absorbed poison, from heat and cold, from moist and dry, from bodily and mental exhaustion comes fever, when all the blood-vessels suffer some sort of disturbance and the whole blood some sort of corruption. And from the blood-vessels thus suddenly disturbed and the blood thus suddenly corrupted, as from their actuating causes, may come rapid congestions or effusions or hæmorrhages or inflammations. Here the actuating cause is so closely followed by its result, that the two are almost coincident. Our treatment hardly discriminates between them. It comprehends both and seeks to counteract both simultaneously. And its success, if it succeed, is speedy and complete. And its failure, if it fail, is speedy and complete in like manner. Patients are quickly rescued or they quickly die.

It is in the fevers of intertropical climates, that these phenomena are most conspicuously displayed as well as the power of medicine in controlling them.

Again, from too little food and defective nutrition, from too much food and excessive nutrition, from noxious food and vicious nutrition; also from simple defectiveness of the digestive and assimilative functions, arise a deteriorated blood and a morbid action of the blood-vessels. And these, as actuating causes, may bring about congestions, or effusions or hæmorrhages or inflammations *slowly* and after the *lapse of time.* Here the actuating cause has had long precedence of the result. Our treatment easily discriminates between them. It comprehends both, but it ministers to each separately. And its success and its failure are always lingering and wait to be ratified by long trial. Patients are slow to recover and slow to die.

Cases of disease are everywhere and every day occurring, which, taken in their origin, their course, their character, their events and in the conditions of their cure, and viewed comprehensively, are specimens of all that is here meant. For diseases may bear diverse names according to the parts and organs which they occupy, and still have a kindred nature and acknowledge a common origin. Visceral fulness and enlargements, œdema of the extremities, bronchial defluxions, and diarrhœa, hæmatemesis and melæna, purpureous spots and scorbutic patches and various cutaneous eruptions, are so many specimens of congestive, dropsical, hæmorrhagic and inflammatory disease. They are to be directly ministered to and kept in check, and cured, it may be, for the present, by their appropriate remedies. And their kindred nature often makes them amenable to such remedies as have a similar mode of operation. But this check or this cure, which they receive, is sure to be temporary only, unless the treatment be made moreover to reach far back to preceding conditions which are their actuating causes; unless, by medicine and by regimen, which have an alterative and tonic power, its healthy quality be restored to the blood and their healthy action to the blood-vessels.

But again there are actuating causes, which are different in their nature from all these and which yet have to do with blood and blood-vessels and which produce the same results, even congestions and effusions and hæmorrhages and inflammations. Some single attack of acute disease may, after it has ceased, leave a damage behind it in the part it occupied, which can never afterwards be repaired. Or some slow disease may have long lain covert, and only at last give notice of its existence by an incurable mischief which it has done. Thus alterations of form and substance, thus degenerate structures and foreign growths arise in any and every part of the body. And then the functions of the part, whatever it be, determines the nature of the injury that results to the health of the individual. If it be the heart, forthwith a disturbance is brought upon the mechanical forces, which move the blood. The blood being unduly accelerated or retarded, arrested or regurgitated, gives occasion to congestions or effusions or hæmorrhages or inflammations.

Here then observe how, in the nature of things, a much narrower sphere is left for the operation of medicine. Medicine is still concerned with the same diseases. But all preceding conditions, which stand in the relation of actuating causes to present results, are placed beyond its reach. With their results and with them alone it is left to deal, as best it may.

These few general remarks upon so large a subject as the treatment of the most important and most frequent forms of disease, which proceed from blood and blood-vessels, will not (I trust) be thought superfluous. I want to find the principle of their curability when they *are* cured, that we may be able to distinguish the cases which fall within it, from those which lie beyond it, and so may come better prepared to our present subject of inquiry.

The principle of their curability then is this, that their treatment should be able to include within its remedial power and agency not themselves only but also their actuating causes. Their suspension, their abatement, even their temporary removal may be possible, although the actuating cause still remains. But then they are ever ready to begin again. This therefore is no perfect cure. Perfect cure looks to the removal both of themselves and of their actuating causes. It does not indeed contemplate that, after their removal, they shall never return. But it *does* contemplate that, before they can begin again, their actuating cause will have to begin again also.

Such is the principle of their curability in the *highest sense*. And if so, it is plain that the congestions, effusions, hæmorrhages and inflammations, which spring from an unsound heart can never fall within it. If such be their cure and nothing less, cured they never can be perfectly.

Nevertheless their suspension, their abatement and even their temporary removal may be considered within the possible reach of medicine. The fact of their having an unsound heart for their actuating cause assigns these as the general limits of what is to be expected from their treatment.

Their suspension, their abatement or their temporary removal is the extreme of what is possible. But how much of what is possible can be deemed probable in any particular case, the circumstances of that case must tell.

There are many forms of unsoundness belonging to the heart. You know what they are; valvular injury, hypertrophy, attenuation, softening, dilatation. And though some of these may have the benefit of a doubt, whether they be absolutely irremediable or not, yet by the time they have produced any of the secondary diseases in question, they must surely have gone too far to admit the possibility of a perfect cure.

Now one might suppose that the mere incurability of the unsound heart, whatever might be the form of its unsoundness, would assign an exact limit to the influence of remedies upon the secondary diseases, which spring from it, and that this limit would be the same in every case. But such is not the fact. The incurability of the unsound heart only determines these secondary diseases not to be curable in the highest sense. What is likely to be the effect of medicine upon them short of perfect cure, that the *particular form* of unsoundness is concerned in deciding.

Simple hypertrophy of the heart allows a freer use of medical means in dealing with its pathological consequences, and permits a fairer hope of the fullest measure of relief which is possible, whether it be of their suspension, of their abatement or of their temporary removal, than does either its attenuation or its softening. Where there is an increase of structural organic power, there are many remedies with which we can interfere from time to time and for a long time together, to put restraint upon the excess of action which naturally results from it. But where there is loss of structural organic power, the remedies are few, if any, by which we can make up for the defect of action which naturally results from it. We can go nearer to reduce a strong heart to the level of a weak one, than we can to raise a weak heart to the level of a strong one. As an ingredient of disease and an object of treatment strength is always more manageable than weakness. And, as with the heart itself so with its effects; congestions and effusions and hæmorrhages and inflammations admit many more remedies, and remedies of much more power and efficacy, when the pulse is strong, steady, and rhythmical, than when it is feeble, fluttering, and irregular.

But there is more to be taken into account than the particular form of unsoundness belonging to the heart, when we wish to measure the probable effects of medicine upon these its ultimate pathological consequences. And it is this; that the unsoundness of the heart is apt to be complicated with organic diseases of other parts, diseases equally capable with itself of producing the same pathological results.

If I except those cases, in which the damage done to the heart could be clearly traced back to some distinct attack of accidental disease, such as rheumatic inflammation, my records of dissections (and they have been pretty numerous) do not supply me with a single instance of a person reputed to die of disorganised heart and its consequences, in whom after death other parts also were not found disorganised, such as the liver, the kidneys, serous and mucous membranes, and above all, and more frequently than all the rest, the whole arterial system. And the kind of disease in other parts has been such as could have in no wise been derived from the heart; but it must have grown out of special morbid processes within themselves, whether prior or subsequent to, or simultaneous with, the disease of the heart.

When, therefore, there is dropsy and with it an unsound heart, you must not be too sure that the unsound heart has been altogether instrumental in producing it. The heart may have only had its share, and its share may have been a small one. When there is dropsy and with it that particular form of unsoundness in the heart, which allows the freest use of medicine for its relief, simple hypertrophy, you must not be too sure that it will be actually relieved; for this hypertrophy is apt to be combined with extensive disease of the arterial system.

But there is more than the unsoundness of the heart itself, however well ascertained in its form and character, and there is more than the superadded unsoundness of other organs, either known or suspected, to be looked to, when we are concerned with the secondary diseases in question. The quality of the very blood which the unsound heart is circulating, now becomes a potent contingency, and may hasten or postpone, may increase or extenuate, all the evils which flow from it; and may modify their treatment and hinder or aid the operation of remedies for their relief.

The general mind of the profession is just now all alive in quest of the elements of disease in the blood. A good deal is in a hopeful way of investigation, and some little is already made out. But let us beware of the common fault of physicians in all ages, and not make too much of our new knowledge and call upon it prematurely to explain every thing. Thus much, however, we cannot help seeing plainly enough, that the opposite states of plethora and anæmia have a vast pathological import both in themselves and in relation to all diseases, come from what source they may. They have it unquestionably, and they display it in relation to those secondary diseases which spring from an unsound heart.

Plethora belongs essentially to the blood, and results from one of its elements, the globules, being in excess. Now think of what plethora is in its effects; how it modifies the functions of health, how it directly conduces to certain kinds of diseases, and how it stamps a peculiar character upon all.

Think of great habitual force of the heart's action and great habitual fulness of the pulse; of blood carrying with it its visible colour of blood much further into the capillaries than natural; of rapid digestion and rapid nutrition, great consciousness of strength and vitality, and great muscular development. Such is the health of the plethoric.

Think of frequent vertigo and ringing in the ears, and frequent drowsiness; of spontaneous congestions and spontaneous hæmorrhages and feverish heat on slight provocations. Such are the proper ailments of the plethoric.

And think of every accidental injury and every accidental disease, whatever part of the body it may befall, being apt to put on the character of inflammation and to demand blood-letting. Such is the peculiar character which they have in the plethoric.

Now plethora, if it be indeed the thing it is here said to be, calls for continual watching and management and discipline to preserve that health which is ever bordering upon disease. And it is well when, without any conspiring circumstances beyond itself, a bare plethora is withheld from being consummated in congestion or effusion or hæmorrhage or inflammation. But when the heart is unsound and perhaps the blood-vessels too, and perhaps many a solid structure besides, plethora means something much more formidable.

Take that form of unsoundness of the heart, which is in itself the least incompatible with the continuance of life, and which is the most easily withheld from becoming worse and whose evil consequences are the most easily postponed, simple hypertrophy of small degree. This simple hypertrophy, when the blood which the heart circulates is plethoric blood, becomes conditionally a worse disease. It is more sure to augment itself and more sure to hurry on rapidly to its worst events. The heart feels an intolerable stimulus and resents it powerfully.

Take other forms of unsoundness, such as greatly diminish the organic power of the heart, or such as put positive mechanical obstacles in the way of the circulation, attenuation, softening, great valvular injury. Then the plethoric blood, instead of being a stimulus, becomes a burden to the heart; a burden which it can hardly bear and hardly move. Then all the face, the neck, and the lips are purple with blood, and the jugular veins stand out, and there is an agonising dyspnœa, and we look for sudden death by cerebral or pulmonary congestion or hæmorrhage.

Again, anæmia belongs essentially to the blood, and results from one of its elements, the globules, being in defect. Consider what anæmia is in its effects; how it, like plethora, modifies the functions of health but in a different way; how it too conduces to certain kinds of diseases, and how it stamps a peculiar character upon all.

Habitual feebleness and frequency and occasional irregularity of the heart's action, habitual smallness of the pulse, the blood failing to give its colour to the skin and to the visible portions of the mucous surface; slow and painful digestion, defective nutrition, cold extremities, nervous depression, mental irresolution, such are the ingredients which go to make up the health of the anæmic at best.

Throbbing in the head, and vertigo and ringing in the ears as frequent as in the plethoric, and pain more frequent and more acute; also spontaneous hæmorrhage as in the plethoric, but now taking the shape of purpureous spots and blotches; and œdema of the ankles and feet, these are the proper ailments of the anæmic.

Then every accidental form of injury and disease putting on the character of weakness; inflammation itself failing to accomplish the proper work of inflammation for want of power, and not bearing the remedies of inflammation, yet still continuing pertinaciously, and often refusing to be cured; such is the character they have in the anæmic.

Now anæmia, bare anæmia, is a thing formidable enough in itself. Without disease or injury of any solid structure whatever, the essential disorder of the blood alone may kill. It may give occasion to passive effusions, and to passive hæmorrhages, and to passive inflammation, which bring on death.

As in plethora, so in anæmia, each unsoundness of the heart becomes conditionally a worse disease, but worse in a different way. As in plethora so in anæmia each unsoundness tends nore rapidly to its evil consequences, but those consequences re apt to emerge in a different manner. Passive effusions, æmorrhages, and inflammations are rather wont to appear verywhere than in certain parts. Death seldom now arrives by ppression of the brain or the lungs singly, but oftener by ppression of many organs simultaneously.

But there is yet another consideration which should be taken nto account, when we are calculating the probability of such uccess as is possible in treating the secondary diseases, which pring from an unsound heart. What I am now going to llude to has nothing to do with any intrinsic pathology. It omes not from within the body, yet does it exercise a vast nfluence upon all that is going on within. Neither is it age r sex or temper or temperament. These things indeed have heir weight; though we need not be over curious (as we someimes are) in putting them in the balance. We may safely rust common sense to take them and weigh them and allow for hem as it pleases. But the consideration I allude to is simply his, whether the patient be bound or not, by the necessity of is being, to live by the sweat of his brow.

One part of mankind can take care of their bodies all their ife long. They need never use them but for recreation. Another part cannot take care of them for a single day. They must be always using them and toiling with them and iving by them. Yet, as long as health lasts, they that can ive at ease, if they will, have no very sure advantage over hose that must labour, whether they will or not. But, when isease comes, their advantage is plain enough; especially, if hat disease affect a vital organ, and, most especially, if it ffect the heart.

Whatever form of unsoundness belong to the heart, the atient's own instinct is continually telling him that he must e still. For want of this needful quiet the heart makes uicker progress in all its changes of structure and quicker ccumulation of their disastrous consequences. It is sooner ypertrophied, sooner attenuated, sooner dilated, and the disurbed blood-vessels sooner betake themselves to congestions nd effusions and hæmorrhages and inflammations. And then, or want of the same needful quiet, the hopes of medical treatment are often disappointed. Neither their suspension nor their abatement nor their temporary removal can now be promised upon any calculation of what the mere state of the disease would render probable. Hundreds of people die many years sooner than their mere disease would bring them to an end. Their disease would still let them live, but their adverse fortune kills them.

There remains yet one more important circumstance, extrinsic though it be, which claims to be noticed. If ever time and opportunity come in to turn the balance of success in favour of medical treatment, it is when we are concerned with the secondary diseases which proceed from an unsound heart.

A disease, which by its own nature is placed fairly within the power of medicine, may by the loss of opportunity escape far beyond it. This is *most strikingly* shown in acute disease but it is *most frequently* shown in chronic. Acute disease is never more severely felt than on its first access; consequently it is then, that it most importunes our aid and most commonly obtains it. But if it do not then obtain it; if from the unfortunate condition of the patient the opportunity then be lost, all is lost.

Chronic disease, on the contrary, is often not felt at all in its beginnings and often little felt in its further progress, and only at last decidedly felt when its effects have so accumulated as to oppress and overbear the functions of particular organs. And then, and often not till then, it first importunes the aid of medicine, when the time is past for counteracting the actions and sufferings which are *the disease*, and nothing is now left but to render *its effects* more tolerable. Here the opportunity, which may be lost by the covertness of the disease, should be saved by the watchfulness of the physician.

But our concern at present is not with original and primary diseases whether acute or chronic, not with diseases engendered anew in a sound body, which nothing might lead us to expect; but with secondary diseases springing from an unsoundness already known, which we are ever on the watch for. Detection therefore is much easier, if the patient be within reach.

Here however is the perplexity, every man, who has an unsound heart, had need to be always under the eye of a physician; and then we, knowing what to expect, should be likely to discern its evil consequences on their first appearance and nstitute our treatment at the time most favourable to its success. But this can seldom be the case. Yet what a vast difference loes it make, whether our treatment commence as soon as a light crepitation is heard in a small portion of one lung, or be lelayed until it has pervaded a large portion of both, or until one side of the chest is entirely dull to percussion. Or whether it commence with the first noticeable œdema of the ankles, or it tarry until serum be let loose into the entire cellular structure of the body and into the cavities of the chest and the abdomen.

I would presume to note it for a predominant fault of systematic writers, that they are apt to take it for granted, that we are always called to treat diseases just at the right time. This is not dealing fairly with us.

Finally, of all that has been stated this is the sum:—

1st. That the fact of congestions or effusions or hæmorrhages or inflammations having their actuating cause in an unsound heart prohibits the possibility of their cure in *the highest sense*, and limits the expectations of medicine to their suspension, their abatement or their temporary removal.

2ndly. That the form of unsoundness in the heart furnishes a measure of calculation, how much medicine will probably be able to effect in the individual case, whether it will go to suspend or to abate or even so far as to abolish them for a time.

3rdly. That the presence or absence of coincident disease in other organs always modifies those expectations of relief by medicine, which the mere form of unsoundness in the heart itself would lead us to entertain.

4thly. That constitutional plethora and anæmia are grave contingencies when they are found in coincidence with an unsound heart, having an important bearing upon its consequences and upon our modes of treating them and upon our expectations of giving relief.

5thly. That, besides all these intrinsic conditions, the extrinsic accident of what may be the patient's circumstances in life throws a great weight into the balance for or against the probability of relief. The man, who, having an unsound heart, must traffic with his sinews, for his daily bread, has a poor chance of benefit from medicine.

6thly. That treatment has never more need of being favoured by opportunity than it has now.

Having thus formally stated the conditions intrinsic and extrinsic, which, being coincident with an unsound heart, give a character to its secondary diseases and place them more or less within the reach of medical treatment, I shall venture to refer to them hereafter, without further explanation, as I may have occasion, when I come to speak expressly of these diseases and their management.

LECTURE XXXV.

PARTICULAR VIEW OF THE SECONDARY DISEASES WHICH PROCEED FROM AN UNSOUND HEART, NOT LIMITED TO ANY CERTAIN PART OF THE BODY. — THE LUNGS THEIR MOST FREQUENT SEAT.—THE LUNGS, THEREFORE, THE CHIEF SCOPE OF MEDICAL TREATMENT.—THEIR NATURE WITHIN THE LUNGS.—THEIR MODE OF TREATMENT AND MEASURE OF CURABILITY GREATLY INFLUENCED BY THE FORM OF UNSOUNDNESS WITHIN THE HEART.—SECONDARY DISEASES OF THE BRAIN.—OF THE LIVER.

When medicine is to be brought to operate upon the secondary diseases proceeding from blood and blood-vessels, which are the result of an unsound heart, we now understand what are the limits of its possible success, and we understand too what are the contingencies which may interpose to aid or to hinder our treatment.

But, after all, enough remains in the power of medicine to make us study the choice of its means and to keep a careful watch upon the opportunities of using them. Possible suspension and abatement and removal, though it be but for a time, are no small things, when they are spoken of diseases, which become inevitably fatal by their continuance or their increase.

But where in the body are these formidable affections, the results and concomitants of an unsound heart, apt to appear? Both within and without, both deep-seated and on the surface, ometimes plain to be seen and sometimes to be searched after before they are found.—Many a man having an unsound heart has been killed before his time by an internal congestion or ffusion, which has gone undetected and unministered to.

Cases of the following kind are not unfamiliar to me. A man has hypertrophy of the heart in a moderate degree with ome small amount of valvular injury or with none at all. Hitherto he has been tolerably free from painful palpitation and dyspnœa except under excitement or extraordinary exertion.

But suddenly he is found gasping and struggling for breath and expecting instant dissolution. What is this; and what is to be done? Truly one might be excused for thinking of angina pectoris or some spasm of the heart, and flying to ammonia and æther and opium for relief. But putting my ear upon the chest I have found a small crepitation diffused through the half of one lung, or in the half of one lung I have been unable to catch any audible murmur whatever either natural or morbid. A single cupping upon the chest, just opposite the portion of the lung that labours, has swept away the crepitation, or has removed the dulness and brought back the respiratory murmur; and the patient has been restored in a day or two to his ordinary state of comfort. Here in one instance there has been sudden and extensive effusion into the extreme bronchial ramifications or vesicular structure of the lung, and in another there has been sudden and extensive congestion.

Such cases as these are very striking. All that belongs to the disease and all that belongs to the remedy is so clear, so marked and unequivocal; pulmonary congestion and effusion suddenly coming on and life brought into instant peril; and then, with the use of the proper remedy, congestion and effusion suddenly gone and life restored to safety.

These are specimens of what is apt to occur in cases of unsound heart; full-sized and full-drawn indeed, yet withal true specimens; and so the fittest to learn by. The same things in kind, but drawn in a less distinct and smaller character, are seen every day.

The lungs in short are the most frequent seat of the congestions and effusions, hæmorrhages and inflammations, which are the results and concomitants of an unsound heart; and the lungs are the chief scope of medical treatment from time to time in many cases, and even the sole scope from first to last in some cases, of unsound heart. For, besides the general reasons, which, when the heart is unsound, render the lungs obnoxious, in common with all parts of the body, to these affections and which are to be found in the obstructed state of the circulation, there are moreover special reasons which render them obnoxious to the same in a greater degree, and which are to be found in the close relationship and mutual dependency of function subsisting between these two organs.

If we analyse carefully the numerous processes of which ny complicated disease consists, it is remarkable how many of hem we shall find among the means and contrivances, to which ature resorts for defending, for prolonging, and, it may be, or rescuing the life of the individual; and how many symp-oms which, as involved in these processes, we call symptoms of isease, we might rather regard as signs of the curative pur-ose, which nature is striving to accomplish.

All this is less apparent in the primary morbid action of a art and its direct symptoms. But it is both apparent and nanifestly true in the secondary morbid processes arising in ther parts and in the symptoms which designate them. Let s take for example the secondary morbid processes going on vithin the lungs, when the heart is unsound.

Nature does, as it were, make use of the lungs as the eadiest and the nearest channel through which to relieve the ppression of the heart. The area of every bronchus and its amifications afford altogether an immense extent of mucous urface; and nature calls sometimes upon a part and sometimes pon the whole of it to relieve the heart and the circulation in heir embarrassment; and sometimes she requires an augmenta-ion merely of its natural secretions and sometimes a separation of pure blood.

It is remarkable for how long a time the lungs are often patient of this extraordinary use, which nature makes of them, without detriment to their structure. For, to whatever extent the mucous membrane may be affected and in whichever way, whether it separate mucus or blood, whether there be an expectoration of phlegm merely or hæmoptysis, the air is often found passing through every part of the lungs within reach and cognisance of the ear; and indicating by sounds here and there and everywhere the fluid it meets with as it passes, and that it does not pass uninterruptedly.

Now this profuse mucous expectoration or hæmoptysis is capable of being suspended or abated or removed for a while. The unsoundness of the heart, by the time these pulmonary symptoms have arisen is commonly beyond the possibility of cure. Yet the numberless miseries contingent upon it are *not* beyond the possibility of great relief and mitigation, which we shall best succeed in procuring, if we keep our minds attentive

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to the processes which nature is carrying on within the lungs, and to the symptoms which bespeak what they are. For they are not only significant of the way in which nature is attempting her own relief, but significant also of the manner in which we should attempt to succour her.

Thus for months and months together and even for years, we may keep people alive and give them incalculable comfort by aiding the lungs in the office of relief, which they are striving to perform, to an unsound heart. This is done by drawing blood from, or by producing vesication or counter-irritation on, the walls of the chest, just when and where and to the extent that may be required. We should endeavour to make out from time to time, by careful auscultation, what parts of the lungs chiefly labour, where they chiefly crepitate or where they are becoming dull, and to the surface of the chest immediately opposite those parts apply our remedies. Thus by taking a few ounces of blood by cupping or leeches, or by applying a blister or a mustard poultice on the *right* spot and at the *right* time, we shall often obtain a degree of relief for our patient, which nothing but experience could lead us to expect. And we shall obtain the like relief in the same case again and again, always provided we take the same care to choose the right spot and the right time in the application of our remedies to the walls of the chest. And what is the secret of our success? The secret (I believe) is this. We are aiding nature in the very channels through which she is seeking to obtain succour for herself. Therefore our remedies are the more effectual.

It would be difficult to overrate the value, as guides to practice, of the signs which declare themselves through the medium of the lungs in every case of unsound heart. The practice which they suggest not only aids the lungs in the office of relief which they are performing to the heart, but it protects the lungs themselves against the mischiefs which are perpetually threatened to their own structure. For though the lungs may not hitherto have suffered disorganisation, yet nature is urged by a hard necessity and is making of them (if I may say so) a perilous use. Exorbitant secretion and hæmorrhage cannot be frequently demanded and frequently supplied from the bronchi and their extreme ramifications, without danger of injury and disease to the whole lung. Such an event we may ward off for a time; and, as long as we succeed in so doing, we preserve for our patient his best chance of life. But, in the event, the lungs can hold out no longer, and undergo changes of structure which more and more embarrass and finally abolish their vital functions. Thus we have condensations and softening and apoplexy.

Such are the operations carried on by the blood-vessels through the medium of the lungs when the heart is unsound; and such is the greatest amount of possible success which medicine can reach in aiding them or restraining them and in rendering them harmless. There is no more interesting field of pathology and practice than this. And herein there is great need of watchfulness, that what is going on between the heart and the lungs should be well made out from time to time, and that medicine which waits to be guided by our view of its necessity, should be brought to bear seasonably upon its objects as they arise.

But no degree of watchfulness, no degree of skill in the use of remedies will obtain the greatest success in all cases or procure a long continuance of life. For circumstances will prevent it.

Those circumstances which have been already set forth as capable of aggravating the secondary diseases of an unsound heart, are all apt to interpose when such diseases especially declare themselves through the lungs. And those circumstances, already noted as limiting the expectations of medicine for their relief, are all apt to intrude their counteracting influence when the special scope of our treatment is the lungs.

The difference between one form of unsoundness and another in the heart itself; the presence or absence of coincident disease in other organs; the patient's constitutional health, the state of plethora or anæmia or the state equally removed from both; the patient's accidental condition respective to external circumstances, whether he be doomed to a life of labour or can choose a life of ease; all these contingencies, whose importance has been anticipated, now find room to make a signal display of their power.

As to one form of unsoundness in the heart; if the heart beat with an excessive impulse yet with perfect regularity and the pulse at the same time be full and strong and steady, the secondary affections of the lungs (other circumstances being favourable) are likely to be of easy management for a long period. The heart is now probably in a state of simple hypertrophy. It has gained a simple increase of organic power and so is acting injuriously upon the circulation; and the circulation seeks relief through the lungs. Here the treatment is a treatment of restraint: that treatment which tells most plainly and speedily upon its objects and is the easiest and simplest of all modes of treatment. And should there be now a bronchial or vesicular crepitation of small extent and short standing, it is remarkable how rapidly it and its attendant dyspnœa are often swept away by a single cupping. Should the same crepitation be of larger extent and longer duration, should portions of the lungs be even condensed, the same treatment repeated may be trusted for bringing about the same result. And not only this, but the unsoundness of the heart being a simple hypertrophy and other circumstances being favourable, affections of the chest still more formidable are found to admit of abatement or suspension or temporary removal; such as habitual or frequent recurring hæmoptysis and hydrothorax. These are the cases in which the remedial power of digitalis is often eminently displayed. They are peculiarly the cases for its use. One chief object of our treatment is (I repeat) to put a restraint upon the excessive force of the heart's action; and this our cupping and our leeches, while they are subsidiary to the lungs in their present distress, contribute at the same time to effect. And digitalis effects it by a direct and specific virtue of its own.

But I must not make it an express indication of treatment in these cases to put a restraint upon the heart's action without adding this necessary caution. Do not seek to bring down the impulse of the hypertrophied heart to the level of the healthy heart. This is not necessary in furtherance of the curative effect of our remedies. Besides, you can only do it by the extravagant use of one of two remedies. You must run the chance either of poisoning your patient with digitalis or of bleeding him into anæmia.

Further as to another form of unsoundness in the heart; if the heart beat with defective impulse and with great irregularity, and the pulse be small and weak and fluttering, then the secondary affections of the lungs, even though other circumstances be favourable, are more difficult to manage and more full of peril. The heart is now attenuated or softened or it is dilated without a proportional increase of muscular substance. It has lost organic power.

Now it may pass for a maxim in physic, that weakness is always less manageable than strength. And here there is nothing but weakness and the natural result of weakness, *suffering* not acting. Here auscultation may detect the same conditions of secondary disease within the lungs as in hypertrophy. But they are only *mechanically* the same, they are *vitally* different; and medicine does not promise the same success in their treatment. Here as in hypertrophy the respiratory murmur is obscured or superseded by crepitations of various degrees and extent. But in hypertrophy the catarrhal and hæmorrhagic states of the bronchi, the pulmonary and pleural effusions imply something active and often partake of an inflammatory character; whereas here they imply something inert and passive.

In hypertrophy of the heart, or that unsoundness which increases *strength*, we treat the secondary diseases of the lungs by cupping and leeches and counter-irritants, and we look for some marked and essential relief; we look for their suspension, their abatement or temporary removal.—And in attenuation or softening of the heart, or that unsoundness which brings *weakness*, we may still treat the secondary diseases of the lungs by cupping and leeches and counter-irritants, but we look for nothing great or striking or complete in the way of relief. It is enough if, by thus making a new outlet for the pent up blood, we succeed for a while in taking off some part of their burden from the heart and lungs.

In the case of hypertrophy, while our remedies were addressed to the special relief of the lungs, I spoke of it being a further indication of treatment, either by pushing the same remedies a little further or by the use of others auxiliary to them, to put restraint upon the force of the heart's action. But this is the very thing we must guard against in the case of attenuation or softening. The heart's action wants sustaining and not restraint. While by our cupping and our leeches we are seeking to take off its burden from the circulation, we must be ready at the same time, if need be, to support and stimulate it. While the heart is flapping and fluttering and its feeble movements can scarce be felt, and the blood is almost stagnant in the vessels going to it and from it, and almost stagnant in the lungs, we cup and we leech and we may even venture to use the lancet and let out two or three ounces of blood from a large vein, but in the mean time we must give our patient wine or brandy.

Thus, I have taken hypertrophy of the heart on the one hand, and attenuation and softening of the heart on the other, for the sake of comparing or contrasting the character and curability of their secondary diseases which declare themselves in the lungs. And it plainly appears that they exhibit a great difference in these respects according as they spring from one or the other form of unsoundness.

Now the differences here denoted in the character and curability of the secondary diseases of the lungs, springing from these two forms of unsoundness in the heart, may be taken to represent all the differences which can arise, be the form of unsoundness what it may. For practically and with reference to their secondary diseases, all forms of unsoundness in the heart may be reduced either to that which augments or that which diminishes its organic power. Practically they are all either an hypertrophy or an attenuation.—They make the heart either over strong or over weak. Valvular injury of small amount often stimulates the heart to the exorbitant impulse of hypertrophy, though there is yet no hypertrophy in fact. And valvular injury of great amount reduces the heart to the feeble, fluttering, irregular impulse of attenuation, though there is yet no attenuation in fact. Nay! valvular injury, when it is such as to produce extreme constriction of its orifice, will bring an hypertrophied heart down to the conditions of an attenuated heart and make it flutter and falter with an irregular and a scarcely perceptible impulse.

While, therefore, it is generally true that the secondary diseases of the lungs take their character and their measure of curability from the form of unsoundness subsisting in the heart, it is not so strictly true as that they have *always* one character and one measure of curability where the form of unsoundness is the same. It might be so, if all the processes concerned were merely mechanical. But here the mechanical cause works through a vital agency. The structural unsoundness of the heart compels it to a new mode of vital action; and this it is, which *immediately* determines what the secondary disease of the lungs shall be. Yet inasmuch as the same form of unsoundness *generally* induces the same mode of action in the heart, it is *generally* safe to refer at once to this unsoundness as if it immediately determined the character and curability of the secondary disease of the lungs. But since the same form of unsoundness, as it may be less or greater, simple or complex, *sometimes* induces different modes of action in the heart and the consequent pulmonary disease affects a different character and has a different measure of curability accordingly; it follows, properly speaking, that the heart's mode of action rather than the heart's form of unsoundness is the real motive of the secondary disease and the guide of its treatment.

But have not I been speaking rather too much of the heart and the lungs, as if they could suffer together and could (as it were) bear each other's burdens, and could carry on their mutual diseases between themselves, other parts of the body having little or no share in the matter? Perhaps I have. Medical teaching however, if it is to be useful, must sometimes be engaged in (what may be thought) an extreme analysis. For the sake of rendering the nature of disease well understood it is allowable to seize upon its simplest forms and to make much of them and to dwell long upon their explanation, before we proceed to the more complex. No matter, that the simplest forms are the rarest. They are the rudiments of all the rest; and our knowledge of all the rest is based upon our knowledge of *them*.

Yet perhaps upon the whole the heart and lungs will be found to keep their intercommunity of morbid action and suffering exclusively to themselves oftener and for a longer time than other organs; and their relative dependency of function may account for this. But still it must be a small unsoundness of the heart, which does not make itself felt beyond the lungs; and, besides being small, it must be either stationary or very slowly increasing, still to make itself felt by the lungs, and not beyond them for any considerable period of a man's life. And, further, the secondary disease or ailment of the lungs must also be of small amount to admit of the same habitual restriction.

And this is really sometimes the case. A small degree of hypertrophy may be stationary or very slowly increasing for years, augmenting the natural impulse of the heart at all times a little, and occasionally a good deal, and hurrying the respiration at all times a little, and occasionally a good deal. So too a small degree of hypertrophy may be combined with a small degree of valvular injury and both may be stationary or increase very slowly for years; and for years the consequent suffering will be restricted to the heart and lungs, and will not exceed the amount specified in either. A certain degree of attenuation also may be stationary or very slowly increasing for years, diminishing the natural impulse of the heart at all times and occasionally making its beats irregular; and, though it do not make itself constantly felt by the lungs, yet it may hinder the man from any very vigorous or long-continued exertion on account of shortness of breath. Many people (it is well known) have an habitually feeble circulation and an occasionally irregular or intermitting pulse all their lives. Yet they pass for well, and really are well in their own consciousness, and live as long as other people. In several such I have convinced myself (as far as it is possible to be convinced about such a matter) that their heart has been weak of structure, and of small size in proportion to their stature; and it is a curious fact that most of those in whom I have found this condition of heart have told me, that they were always short-winded and that at school they could not exert themselves like other boys; they were accounted bad runners. These are small things indeed; but they are the elements of greater things, and therefore they are worth mentioning.

The brain comes next to the lungs in its ready acceptance of injurious influences from an unsound heart. Dr. George Burrows has made good this conclusion by bringing together the scattered experience of others, and setting it in order, and testing it, and illustrating it by a larger and better experience of his own.*

Already I have said something of the troubled functions of the brain during the actual progress of acute inflammation

* Burrows on Disorders of the Cerebral Circulation.

in the pericardium, in the endocardium, and in the muscular structure of the heart, and during the period of their precarious reparation; I have spoken of the diversity of form which belongs to them, and of their perilousness and fatality, and of the strange disguise of their true origin in the heart under the more prominent symptoms referable to the brain, such as delirium and convulsions. Here surely there is more than we can yet account for from the known pathology of blood and blood-vessels and from mere derangement of the circulation.

But the heart, in its various chronic forms of permanently abiding and still increasing unsoundness, does not lose the power of influencing the brain injuriously and fatally. And now it is much easier to see it acting through the medium of the circulation. This is a great subject, and I would willingly leave it to the lucid exposition of Dr. George Burrows*; but, as it falls in with my purpose, so perhaps I may be expected, here to state summarily what I know of it.

I would state then summarily, that it belongs to the heart, in its different states of permanent unsoundness, sometimes to affect the brain perilously or fatally, the brain itself being altogether free from disease; and sometimes only to bring the disease, which already exists within the brain, sooner, and more inevitably, to a perilous and fatal event. The work may be entirely of the heart, or it may be shared between the heart and the brain.

I would mention especially two forms of cerebral affection, contrasted with each other, and always perilous and often fatal, which are the entire work of the heart but derived from different states of unsoundness within it.

The first is apoplectic coma, coming and going (when it *does* go) under these conditions. There is stertorous breathing, and foaming at the mouth and present insensibility, and lividity of the lips and some distortion of the features. The needful remedies are applied. As much blood is taken from the temples by cupping as can safely be borne, and sense and consciousness are gradually restored, and *no paralysis is left behind.*

Here neither serum nor blood, I presume, has been let loose upon the brain. The whole mischief is effected by the blood still within its proper vessels, by its congestion, retardation, or remora. How this came to pass, the coincident unsoundness of the heart is ready to explain. The disease consists of passive dilatation. There is a ventricle (commonly the right) of large capacity, with such a condition of its parietes as brings loss of power, *i.e.* dilatation either without proportionate hypertrophy, or with positive attenuation or with conversion of muscle into fat.

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* Burrows on Disorders of the Cerebral Circulation, p. 105.

This form of apoplectic coma I have witnessed in many individuals, and (what is more instructive) again and again in the same individual. There is great peril in it. The brain must be set free or the patient will inevitably perish. The treatment by blood-letting, as far as I know, can alone do this, and place the patient in present safety. But this treatment needs great care in the management. Knowing the case I have had to deal with, and minding to use all needful caution not to exceed the requisite measure, nevertheless I *have* sometimes exceeded it, and my patient after cupping has passed from coma to convulsions. So difficult is it sometimes to avoid the mischances of a needful remedy!

The other form of cerebral affection in which the brain suffers secondarily and derivatively from the heart has, as far as I am informed, been nowhere pointed out. And indeed it is confirmed to me by much fewer examples which I can call to mind than the apoplectic coma. Nevertheless, when it *does* occur, its character is so plain and unmistakeable, that I cannot doubt the reality of the thing which I am speaking of.

The heart by the simple vehemence of its action has the power to kill; and to kill through the medium of the brain. The head is racked with continual pain. There is little or no sleep. The patient becomes delirious, then maniacal, then convulsed, and he at last sinks from exhaustion of his nervous system.

I have already given a case which had this termination.[*] Hypertrophy and dilatation of the left ventricle followed the unrepaired effects of acute endocarditis and pericarditis. The liver had been enormously congested. Fluid had been largely effused into the cavities of the pleura and peritoneum and generally into the cellular structure throughout the body. But liver and lungs and pleura and peritoneum and all the cellular tructure had been unloaded and brought back to the apparent conditions of health. Thus the patient was set free from the more formidable consequences of his disease; and the disease tself was brought back within the limits of its original seat n the heart. The same consequences never returned. But in three weeks more he was dead. He died in the manner specified. The heart, I repeat, by the simple vehemence of its action had the power to kill, and to kill through the medium of the brain.

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[*] Page 199.

There are yet other cases in which death takes place *through* the brain but *by* the heart; *through* the brain affected a good deal after the same manner which has just been described, and *by* the heart acting with the same unappeasable vehemence; this vehemence however being induced by other conditions of disease within it. I have seen a few instances of death from chlorotic anæmia. What has then been the exact physical state of the two organs I cannot tell, but the symptoms during life have taken their direction from the heart to the brain. The excessive energy of the heart and arteries has sensibly worn out the brain, and the course of events has followed in this fatal order; sleeplessness, delirium, mania, exhaustion, death.

But it has been said that it may belong to the unsound heart only to bring the disease, which already exists within the brain, sooner and more inevitably to a perilous and fatal event. Apoplexies and palsies and epilepsies are thus often shared between the brain and the heart. There is enough in the brain to produce them but not enough to produce them *yet*. There is enough in the heart to lead to them but not enough *yet* to bring them actually to pass. The ossified blood-vessels of the brain want some unnatural congestion or some extraordinary impulse, such as an unsound heart can give to the blood within them, that their disease may have its present effect in effusion, or hæmorrhage. And the unsound valves of the heart or its active or passive dilatation must have their capacity of doing injury to the brain, helped and exalted by the ossified blood-vessels of the brain itself.

But the external influence thus fatally felt by the brain does not always proceed simply and exclusively from the heart. When the unsound heart does a prior injury to the lungs, then it and the lungs are apt to work together conjointly to the further injury of the brain. The brain is racked and exhausted by the vehement impulse of its blood-vessels, or oppressed by their congestion, and thus much it owes to the unsound heart. But the brain is also poisoned and narcotised by an impure undecarbonated blood, and thus much more it owes to the damaged lungs.

Any unsoundness of the heart, which is of considerable amount and still progressive, is apt to carry its secondary diseases beyond the lungs and beyond the brain. And, wherever they are found they are still of the same kind, and blood and blood-vessels are still the agents of them. Thus the liver is sometimes found filling half the abdomen, and this enormous increase of its bulk is owing to the accumulation within it of blood and bile. Such a condition of the liver is the more especial accompaniment of those forms of unsoundness in the heart, which arrest the blood in its return through the veins, of attenuation, of softening, of dilatation without proportionate increase of muscular power, and of great valvular impediment.

It would carry us beyond our subject to enlarge further upon these secondary affections of particular organs. But that which, in the nature of secondary disease, chiefly declares the all-pervading and all-subduing power of the original malady of the heart, remains to be considered, I mean general dropsy.

The secondary diseases of the lungs and of the brain carry with them their own peculiar dangers. For these organs are eminently vital in their office and use. But the secondary diseases of the lungs afford the more delicate test (so to speak) of what is amiss within the heart. For both are so strictly bound together by their relative dependency of function, that all which goes wrong within the heart, from the least thing to the greatest, the lungs are ever ready to feel and to show that they feel. Yet the first appearance of dropsy in distant parts, while it denotes no present danger and calls for no instant remedy to save life, proclaims a greater mischief. It declares the heart fatally damaged as the centre of all life and of all function throughout the body. "The silver cord is loosed; the pitcher is broken at the fountain."

LECTURE XXXVI.

THE NATURE OF DROPSY WHEN IT PROCEEDS FROM AN UNSOUND HEART. — THE PURPOSE IT SERVES. — TREATMENT. — ITS OBJECTS.—ITS SUCCESS, WHEN THE DROPSY IS SMALL, UNDER FAVOURABLE CONDITIONS.—ITS SUCCESS, WHEN THE DROPSY IS LARGE, UNDER FAVOURABLE CONDITIONS.—WHAT THESE CONDITIONS ARE IN EACH CASE RESPECTIVELY.

Dropsy is indeed a large field. But I have only to do with what is proper to it and to its treatment, when it results from an unsound heart; and I will take the best heed I can to keep within the due bounds of my subject.

Now what is proper to dropsy when it results from an unsound heart is this, that nature intends by it her own relief, and in different measures succeeds in obtaining the relief which she intends. But I can hardly expect you to understand what I mean without some explanation.

Dropsy consists pathologically of two parts. One part is the act of separating the serum from the mass of blood, the other is the accumulation of the serum after it is separated. The first is the essential morbid process, *the* disease; the second, though it be popularly considered the disease, is only an unfortunate accident; for if the general cellular structure and the circumscribed cavities into which the serum finds its way had any direct outlet, then there would be no accumulation, and in the popular sense there would be no dropsy.

When therefore I say that, in cases of unsound heart, nature intends by the dropsy her own relief, I mean, that she does so by the essential process of which it consists, not by what accidentally follows it, which is an undeniable evil. It is good that the serum should be separated from the blood; for the present necessity requires it. But it is evil, that the serum being separated should accumulate within the body; for it harms and hinders the functions of every organ upon which it rests by bringing upon them an unnatural incumbrance.

In speaking of what *nature intends* it is difficult not to use language which may seem to favour some foolish hypothesis. But in point of fact we always must form a judgment of what nature is aiming at whenever we interfere with what nature is doing. And as our practice is sometimes right, it is presumed that a right judgment is both attainable and sometimes attained.

In this dropsy then, which results from an unsound heart, our views of treatment will be simplified by keeping in mind these two points, 1st, the relief which is sought by the effusion of serum. Yet 2ndly, the mischief which actually follows its accumulation.

Rather a subtile refinement, however, perhaps you will say, thus to claim a character of good in its design for that which inevitably terminates in evil! It is like taking a *salutary* leap into perdition. But we shall see. Let the matter be taken as I state it for the present.

In every case of unsound heart the first appearance of the least dropsical symptom marks an eventful period: it marks the period when a new law is beginning to take effect in the circulation and to gain a mastery over the law of health. The law of health of which the sound heart is the prime agent, retains the blood within the blood-vessels, or dispenses it only for the needs and uses of health. The new law, of which the unsound heart is still the prime agent, suffers or forces the blood or some of its constituents to escape and to form accumulations of serum out of the courses of health.

A little œdema of the ankles or a little œdema of the face is a sufficient notice of the first yielding of the blood-vessels to this new law, which is no other than a mechanical necessity against which they can no longer hold out. It is the earliest beginning of serous effusion, which may go on increasing until it has pervaded the entire cellular structure and filled every serous cavity of the body.

All this calls at once for medical treatment. But what is to be done? The circulation *must* have the relief it seeks somehow. Disburden itself it *must*. There is a physical necessity in the case from which we cannot set it free. Or if we could, it must be by interfering remedially with the actuating cause, *i.e.* by curing the unsound heart. But this is impossible. What then can be done?

This can be done and this only. Seeing what nature is doing and must do, we can only go along with her and seek to aid her in accomplishing her own purposes through other and less hazardous channels. Nature is seeking relief by directly evacuating the blood-vessels of their contents. We must try to gain for her the same relief by augmenting natural secretions and so evacuating the blood-vessels through natural channels. The kidneys and the intestinal canal and its subservient viscera are the most eligible for the purpose.

Here I would remark that it is most fortunate when we have the opportunity of witnessing and treating the dropsical symptoms of an unsound heart upon their first appearance. Much may now be done for the protection of life by a just appreciation of what is going on and by skilfully ministering to it. A swelled ankle or a swelled eyelid is an important indication of medical treatment in every case of unsound heart, from the vast meaning which it conveys.

This happy opportunity of treating the dropsical symptoms of an unsound heart at as early a period as possible is afforded chiefly by a certain class of patients, by those who are rich and well-off in this world. Such men, besides the ampler share they have of the good things of this life, have also readier means of averting or lessening its evil things. They cry out as soon as they are hurt, and they no sooner cry than they get well attended to, and obtain all the aids of medicine, just when it is most likely to do them good. But the poor man looks down upon his swelled ankles a long time without complaining. He hardly cares about the matter, until the swelling reaches his knees, and seldom thinks of applying for advice, until it is much more extensively diffused.

When, therefore, the happy opportunity just described does occur, we often succeed in dissipating small dropsical swellings, or in preventing their increase. And we succeed, not by any severe discipline long continued but by gentler methods occasionally employed; by medicine now and then addressed to the bowels or to the kidneys, which obtain from one or the other for a few days together discharges, which somewhat surpass the natural measures of health. The circulation being thus easily disburdened from time to time, is kept from the necessity of larger effusion, and the œdema after the lapse of years, in some fortunate cases, is still trivial in itself and formidable only as being inceptive and premonitory of something worse.

Now observe, medicine is here concerned only with one part of dropsy and that too the easiest to manage. There is only just visible swelling enough to denote the fact of serum being in the course of separation from the blood-vessels.

But when we thus succeed in abating or suspending or entirely removing the dropsical swellings of an unsound heart from time to time or for a long time together, and when we thus anticipate or alleviate the miseries of existence and put off death for years, there must be more in our favour than the mere fortunate opportunity of commencing our treatment with the commencement of the secondary disease. The primary unsoundness of the heart itself must not be of the worst kind; neither valvular injury enough to produce great *positive* obstruction, nor attenuation or softening enough to produce great *virtual* obstruction. There must be no concomitant disease of great amount in other internal organs, in the liver, in the kidneys, in the lungs; no diffused unsoundness of great amount throughout the arterial system, no marked constitutional pravity, no decided plethora or anæmia. A moderate hypertrophy or a moderate attenuation almost stationary or slowly increasing, with very little valvular injury or none at all, may be the actual form of unsoundness. This would impede the circulation enough to call upon nature for relief by direct separation of serum from the blood-vessels; while it might admit of a substituted and less hazardous relief, by an increase of secretion from organs having a natural outlet.

But the happy opportunity before described is often lost, and the dropsy from an unsound heart has often proceeded to large accumulations before its treatment begins. And this especially happens when the poor man is the patient. The poor man, the victim of an unsound heart, is often brought to the hospital having every part of his body, which can contain effused serum, already filled and distended with it, yet hitherto nothing has been done or attempted for his relief. Here medicine has a much harder work to accomplish from the first. It has both parts of dropsy to deal with. It has a vast amount of accumulated fluid to get rid of, and then to prevent it from accumulating afresh. Yet it has wonderful success in some such cases.

Here the most powerful remedies given and repeated as frequently as the strength of the patient will bear, are indispensable to the purpose that we wish to achieve. Large dropsical accumulations are seldom drained off, by the operation of diuretics, through the kidneys alone. They subside rather under the purgatives, which obtain day after day large watery evacuations from the bowels.

But a wonderful success (I repeat) is sometimes obtained even under the disadvantage of late treatment. And, if when time and opportunity were with us, we had need that the essential condition of the disease should also favour us, in order to compass the easier task of keeping down the dropsy which had only just begun to appear; surely, when time and opportunity are now against us, and yet we are able to compass the much harder task of first getting rid of a largely accumulated dropsy and then of keeping it down in future, there must still be some essential element in the case which is greatly propitious to our remedies.

Recollect all the conditions already mentioned, the particular form of unsoundness in the heart and the absence of coincident disease in other organs, which came in aid of the fortunate opportunity and enabled us to deal successfully with the smaller dropsy. The same must now be found ready to compensate the loss of the fortunate opportunity and ready to help us in dealing with the larger dropsy, or we shall not deal with it successfully. All these conditions there *must* be ; and there is as far as I have seen, and perhaps there must be, something besides.

Now this I have observed. Where the unsoundness of the heart is the same in kind, dropsy will show itself at different periods of its progress in different cases ; earlier in one man and later in another. I do not pretend to explain the universal reason of such diversity ; but I think I see *a* reason for it which will hold good to a large extent. Among the various ways in which the fortunes in life of those, who are the subjects of an unsound heart, can modify the expectations derived from the intrinsic conditions of their disease, there is one which is very remarkable.

In those who are well-off in the world, dropsy seldom arrives until the unsoundness of the heart has reached the point, at which the circulation can endure its oppression no longer without seeking relief by effusion of serum. But in those who are ill-off, dropsy often appears long before the unsoundness has reached the point at which it would naturally and necessarily take place. In the first the injurious operations proper to the heart's unsoundness are less accelerated by accidental circumstances, and so its evil consequences and dropsy among the rest are found to tarry, until it has itself become absolutely great enough to produce them. In the second its proper injurious operations are unavoidably quickened day by day and every hour of the day by accidental circumstances; and so a smaller disease in one case is more felt than a larger disease in the other, and its evil consequences and dropsy among the rest arrive sooner.

We may well be surprised at the complete success which occasionally attends our treatment of the vast dropsical accumulations, which accompany an unsound heart. But in such cases it will be found that, but for the patient's unfortunate circumstances, there would have been no dropsy at all, the affection of the heart being not yet ripe for it.

It is within my experience that the same individual, having an unsound heart, has been received into the hospital again and again and discharged again and again after the complete cure, for the time, of vast dropsical accumulations.

A young man, who had been cured before of very extensive dropsy more than once, and had returned to his occupation, was carried into the hospital now in a state, which seemed far beyond all hope of relief. His legs and thighs were immensely swelled, his countenance was dusky, his lips livid, his eyes vascular, almost starting out of his head, his air-passages loaded with mucus, his jugular veins prominent, his heart acting with great vehemence within the chest, and the pulse at the wrist very small. He was at once moderately bled from the arm with immediate relief; and in a few days he was moderately bled again. Leeches were applied to his chest. All the secretions of his body were solicited by suitable remedies. In three weeks he was walking about the ward and begged to be discharged, thinking himself well. And indeed he had entirely got rid of the dropsy, the cough, the expectoration, and, in some measure, of the venous congestion. The lungs were freely pervious to air without any unnatural sound. The symptoms immediately referable to the heart were the only symptoms which remained; and these were such as denoted moderate hypertrophy and a small amount of valvular disease. The secondary diseases, the dropsy and the bronchial and pulmonary congestions and inflammation and catarrh, had all come on prematurely. He would have had none of them if he had not been obliged to labour for his bread.

At the time this young man was admitted into the hospital and all the while he remained with us, and still after he left us, there was in the same ward a little boy. And the little boy lay in the next bed to him, and saw him brought in in a dying state, and witnessed how every remedy told for his relief; how day by day he became better and better, until all his dropsy and all the anguish of his chest were gone, and he could now walk about like other men; and how in a few weeks he left the hospital apparently well.

Now the little boy had the same disease as the young man. His whole body was dropsical, his heart beat with a violent impulse, and he had great anguish of respiration. And, when I came to his bedside each day and still found him no better, I fancied by his looks that he was ready to say, "And why cannot you cure me as well as him? I am not as ill as he was. But now he is well, and why am not I well also?" It is true, that there was in the little boy a less amount of secondary disease, less of dropsy and of pulmonary congestion and catarrh than in the young man, but there was a greater amount of unsoundness in the heart. Yet it was the same in kind; the symptoms immediately referable to the organ denoted *great* hypertrophy with valvular disease. No medical means procured him more than a very slight and a very brief alleviation of suffering. And he died.

More, much more, might be said upon this subject of dropsy, as well as of the other secondary diseases, proceeding from an unsound heart. But I must keep within reasonable limits, and be content rather to fix attention on what is most desirable to be known, than wish to say every thing that can be said.

As to the management of these same secondary diseases, I have dwelt more upon principles of treatment than upon particular remedies. For congestions, effusions, hæmorrhages and inflammations, from whatever cause they spring, our remedies are numerous enough. Indeed I wish they were fewer. For then, perhaps we should better understand their use and do more good with them in the end. The difficulty is not so much to find a remedy as to choose one.

And indeed for congestions and effusions, hæmorrhages and inflammations, when they proceed from an unsound heart, there is less need of seeking distinct and appropriate remedies. As they come from a common cause, and are of a kindred nature, and are apt to occur together or interchangeably in the same subjects, so we are much oftener called upon to treat them together or interchangeably by the same, or by little variation of, remedies, than to treat them one by one, as separate results, each by a remedy proper to itself.

Such is the best summary I am able to give, within the compass which I have allowed myself, of this very large subject, comprehending the manner in which unsoundness of the heart in its various forms makes itself felt in the vascular system, and through the vascular system in every organ and in the functions of every organ; and how thus it gives occasion to various kinds of secondary disease. I have wished to make my summary a fair transcript of the truth. But there is a certain imperfection in our knowledge of all these matters which we have been handling, rendering it a difficult task to give such descriptions of them as will be at once seen and recognised as true.

There is that in the nature of chronic disease, which makes it only half disclose itself. It discloses itself only in its results, and not in its operations. Whereas acute disease discloses itself in both. The knowledge therefore, which we have of chronic disease, is only a half knowledge compared with what we have of acute. In chronic disease we see only what it has done, not what it is doing; in acute disease we see both.

Coleridge, in one of his profound moral speculations, speaking of the difference between the secret and slow-working influences, which imperceptibly change men's opinions and professions, and those violent motives which revolutionise them at once, makes use of this beautiful illustration: "The difference is merely that between the hour hand and that which tells the seconds on a watch. Of the former you can only tell the past motion; of the latter both the past motion and the present moving." Just such is the difference between chronic disease and acute. Of the former you can see only the past effect; of the latter both the past effect and the present effectuating.

But not only is the task of describing chronic disease rendered difficult from the imperfection of our knowledge, but also from the manner in which such knowledge as we have must needs be obtained.

We learn acute disease from seeing it as a whole; from seeing it as it is acted and suffered through all its stages by the same individual men and women. Being an affair of a few days or a few weeks only, we are often present as eye-witnesses of it from first to last. Thus our knowledge of it is drawn from single and complete histories. And a few cases well watched and remembered are enough to make that knowledge of considerable amount.

Now the mode of obtaining our knowledge being thus easy and summary, the mode of imparting it need be no less easy and summary in its turn. And so the description of acute disease is never difficult, if the describer, mindful that his own knowledge of it came to him by the simple observation of closely consecutive facts, be content to give a simple and consecutive account of them.

But it is very different with chronic disease. We do not learn it from seeing it as a whole, as it passes through all its stages in the same individual men and women. Being an affair not of days or weeks, but of months and many months, and oftener of years, and oftener still of many years, we are indeed very seldom present as eye-witnesses of it from first to last. Thus our knowledge of it is not drawn from single and complete histories, but put together piecemeal from numerous imperfect ones. And after all we get more knowledge complete and at once from a single case, when the disease is acute, than we gather piecemeal from twenty, when the disease is chronic.

Now of knowledge so obtained it is very difficult to give a consistent and summary account. And thus a description of chronic disease can hardly be made intelligible without some artifice or management, which may prejudice its truth. The most useful and perhaps only just representation that can be made of chronic disease is not in the way of description but of commentary; of commentary upon the great facts arising in the course of its duration, which mark its periods and stages; which denote its pauses, its retrogression or its advance; which furnish indications of treatment; which announce its invasion of important organs or systems of organs, and the holding out or surrender of the sources of life.

LECTURE XXXVII.

AFFECTIONS OF THE HEART, CONSISTING IN A CERTAIN ASSEMBLAGE OF SYMPTOMS, NOT IN EXPRESS FORMS OF DISEASE.—GENERAL REMARKS UPON THEM. — THEIR PATHOLOGICAL CHARACTER.—THEIR TREATMENT.—ANGINA PECTORIS. — ITS PATHOGNOMIC SYMPTOMS.—ITS EFFICIENT CAUSE; NOT ANNEXED TO ANY ONE FORM OF UNSOUNDNESS IN THE HEART, BUT PROBABLY PRODUCED BY SPASM, WHICH IS INCIDENT TO MANY.—SUDDEN DEATH WITHOUT PREVIOUS ILLNESS.—CASES. —PROBABLE CAUSE, SPASM OF THE HEART, OR A FIRST ATTACK OF ANGINA PECTORIS.

An interesting portion of our subject yet remains, which will be found different from those portions of it hitherto considered, as in other respects so chiefly in this, that it has a less objective character.

The practical purpose of these lectures has required us all along to look at diseases of the heart through their living developments. We have indeed regarded them in different lights and perspectives and from opposite sides, and near and from a distance, but always through the medium furnished by living circumstances. For what has their clinical diagnosis comprised, but the nearest living manifestations of their actual presence? and what their clinical history, but those prior and accompanying conditions in the life and health of the patient, which were found variously leading to and variously promoting and causing them; as well as all those subsequent conditions in the life and health of the patient variously springing *from* them and variously promoted and caused *by* them? and what was their treatment conversant with, but the means of influencing those same conditions and of influencing them for good?

But, withal, we have never lost sight of the objective reality of the diseases themselves. We have had by turns present to our minds an endocarditis or a pericarditis; a stricture at this

Therefore, when we have confessedly no strict knowledge of any thing beyond them and the aim of our practice must needs centre in the symptoms, we are not to lament over the shortcomings of our art and its straitened capacity of doing good. For it does not follow, that, if we knew *the disease* ever so well, we could treat it otherwise than we are now treating its symptoms, or that what we are now doing for the symptoms would not be the best and would not be all, that could be done, for the disease itself.

Some remarks have already been made upon pain referable to the heart; to the effect that it was a very uncertain guide to the diagnosis of its diseases, and a very uncertain measure of their severity. For in some of the most formidable, as endocarditis and pericarditis, though pain was generally present, it was sometimes entirely absent, and, being present, it was often of small amount when the disease was severe, and often of great amount when the disease was trifling.

But pain with one awful accompaniment may be every thing; the prominent and all-absorbing symptom; denoting the disease, and measuring its severity. So that the very disease itself is called pain, angina pectoris or pain of the breast.

Now none can well describe the quality of a pain but those who have felt it. And the subjects of angina pectoris report, that it is a suffering as sharp as any that can be conceived in the nature of pain, and that it includes moreover something which is beyond the nature of pain, a sense of dying.

This angina, this mixture of the sharpest pain with a feeling of instant death, has its seat in the upper, the middle or lower part of the sternum; it passes through the chest to the spine, often inclining more to the left than to the right side. It comes suddenly and goes suddenly. This is all which constantly belongs to the disease.

Its definition might run thus. Pain of extreme severity passing through the chest from the sternum to the spine, arising suddenly and ceasing suddenly, and accompanied, while it lasts, with a feeling of approaching death. Now, although I have no great opinion of definitions for the use they serve in medical teaching, and am quite sure that their adoption generally for this purpose would convey very cramped notions of disease, yet there are good reasons for speaking very carefully (if not logically) on our present subject. Angina pectoris from the time it was first described by Dr. Heberden has always had a large share of attention paid to it. Much has been written about it, and well written, by some of the best men in our profession. But it is still of very doubtful pathology; and its pathology has little chance of being further illustrated, unless there be a clear agreement among us what we are to understand by the thing itself.

There is a form of dyspnœa which, from its suddenness, its severity and the pain of approaching death which attends it, is very apt to be confounded with angina pectoris. From what I read in books and what I hear in my intercourse with medical men I suspect that they both pass popularly for the same thing. But it is most needful that our ideas of each should be kept separate. As angina pectoris may in certain cases be complicated with many affections with which it has no necessary connection, so it may with dyspnœa. But the two are naturally distinct, and the first and best writer upon the subject emphatically marked the distinction.*

I believe that the definition, which has been given, includes all that is proper to angina pectoris and excludes all that is not; and that it consists essentially of pain in the chest and a sense of approaching dissolution. Not from the absolute constancy but from the very great frequency of its occurrence there is one more element, which has a claim to be considered almost as a part of the disease. Its very peculiarity forces it upon our notice. It is an extension of the pain to one or both arms, most frequently to the left and stopping at the elbow, sometimes to the right, and sometimes to both and sometimes reaching to the fingers.

But what is angina pectoris? Its symptoms, striking and definite as they are, do not carry their own interpretation along with them. They tell neither whence they are, nor what is their efficient cause. Towards such information we must gain what help we can from the many circumstances which various clinical histories and various dissections have disclosed.

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* Initio hujus ægritudinis cætera omnia homines valent; et seorsim nulla tenentur spirandi difficultate, a qua hic pectoris angor prorsus est diversus. (Heberden. Comment. 309.)

And there are plenty of such histories and dissections upon record. I have both seen many and read many.

But all the cases, which one sees or reads of a particular disease, do not necessarily add to our knowledge. They may make knowledge which we have more familiar without augmenting it. They may freshen our experience without enlarging it. Yet some one case out of many, from peculiar circumstances belonging to it, may teach us something, which we did not and could not learn from all the rest.

Thus I have three cases of angina pectoris to report, two falling under my own observation and the third coming to me upon the best authority, which added something at least to *my* knowledge of the disease.

R. R. was apparently about 50 years of age. I saw him for the first time in January, 1837. He looked perfectly well; but said that he had two complaints for which he wished to consult me. One was a little teasing cough which only came on at night and prevented sleep. It was all that remained of an attack of influenza he had suffered. He made light of it and said, he should not have thought of troubling me about it, if it had not interfered with his rest. The other complaint he feared was something more serious which he would rather talk over leisurely with me the next day. But before I left the room, he gave such a sketch of a paroxysm of angina pectoris as could not be mistaken. I merely ordered him an opiate to take at night.

The next day I found that he had slept well in the night and that his cough had left him. And now he described more at large "the other complaint" which he had suffered and at which he could not help being alarmed. He dwelt upon the agony of pain in the sternum, the sense of approaching death and the pain in the left arm, and then his instantaneous and perfect recovery. Hitherto he had consulted no medical man about it. He did not know what it was; but his own feelings had awakened his fears, and he believed it to be something formidable.

Now this gentleman had during the preceding summer made a walking tour through Switzerland, during which he experienced no bodily inconvenience, and had returned home as well as ever he was in his life, and then he had, according to his custom, had his full enjoyment of shooting during the

Autumn. In short, until a fortnight ago he had not had a feeling about him which gave him the slightest hint that he was not in perfect health. It was but a fortnight ago, while walking up the hill towards Hampstead, that he had his first paroxysm of angina pectoris. During this short fortnight the paroxysms had been increasing in severity and frequency. At first they occurred every two or three days, then daily and now several times a day; at first with, and now without, an exciting cause.

I made a very careful examination of his chest. The respiration was perfect. The heart was free from all unnatural murmurs. Its beats were quite rhythmical. The exceeding feebleness of its impulse was all that deserved notice.

I saw him again in the afternoon of the next day, when he described to me a paroxysm, which he had suffered in the morning, severe beyond all his former experience. But it had entirely passed away, and he now looked quite well.

What I heard to-day made me quite alive to the extreme peril of my patient. He was a stranger to me, yet I felt uncomfortable at the probability of his dying under my care, before I had made any communication of his dangerous state to his friends. So before I left the house I obtained the address of his brother, to whom I determined to write as soon as I got home. It was an hour however before I reached home, when I found a messenger waiting to announce to me, that, soon after I left him, my patient had been seized with another paroxysm and died at once.

Upon examination after death the heart was of its natural size, its cavities of their natural capacity, its walls of their natural thickness, and its internal lining and valves bearing no marks of disease. Its muscular substance was more loose of texture than natural, but not softened in an extreme degree, and both its coronary arteries were entirely converted into calcareous tubes as far as they could be traced. The aorta throughout the chest and the abdomen did not present the smallest space free from disease. In some parts calcareous matter was deposited between its coats, in others cartilaginous, and in others a matter between cartilage and bone. This disease, besides destroying the elasticity of the aorta at every part, had greatly narrowed its calibre at a small space of its descending portion within the chest and so produced some real impediment to the passage of blood. We did not examine the state of other blood-vessels. Other viscera of the chest and abdomen were healthy, except that there was a close and complete adhesion of the pleura of the right lung to the ribs without the least apparent detriment to the lung itself.

There was nothing extraordinary in this case as far as the mere symptoms went. These ran exactly parallel with the definition. They were neither more nor less than *the disease*, and so taught me nothing which I did not know before. But there was still a circumstance in the case which was new to me. It was this; the brief period that intervened between the paroxysm first denoting the patient's disease and the paroxysm of which he died; between the first paroxysm and the last. In a first well-marked paroxysm of angina pectoris befalling a man apparently healthy I should have seen the harbinger of almost certain death, but, relying upon what experience had taught me, I should not have expected the fatal paroxysm to arrive for years. But here it arrived in a fortnight.

I make no observation upon what dissection disclosed in this case at present.

J. C. was 64 years of age, a robust man in a humble condition of life. I saw him for the first time, and once only, on the 25th August, 1841. He was in bed, lying on his back with a countenance expressive of the sharpest pain. The pain he described as passing from the upper part of the sternum through the chest to the back, and down both his arms to the tips of his fingers. His complexion was not paler than natural, and his respiration was a little, and only a little, hurried. Altogether he had the look of a man who must quickly die, if he was not quickly relieved. The relief came in a few minutes and he was able to answer questions.

Auscultation found his heart beating with a perfect rhythm and neither with excess nor defect of impulse. Its sounds were natural but loudly intonated and conveyed over the front of the chest far beyond the præcordial region. The respiratory murmur was vesicular, clear, and unmixed, throughout both lungs, except perhaps at a small space of the lowest part of the right, where it seemed not quite so free as elsewhere and was accompanied by a very slight sound of moisture.

This man until within eight days had believed himself in perfect health. His first attack was on the 16th. It came on without any apparent cause, and, by the account of his medical attendant, was a genuine paroxysm of angina pectoris. His second was on the 20th. From that time the paroxysms (it was said) were many every day and many more every night. The change from the erect to the recumbent posture always produced them. That which I witnessed was caused by his going to bed for me to examine him. Their duration was between five and ten minutes. The day after I saw him he had eight or nine paroxysms, and the next day at 2 A.M. he died. The period from his first attack to his death did not exceed ten days.

An examination of the body was made on the day of his death, when the pericardium was found to contain two ounces of clear serum, and upon its surface covering the heart it presented a few small white spots. The heart itself had an appearance of general enlargement. Its internal lining and all its valves were healthy except that the processes of the mitral valve might be thought a little thickened, but not so as to hinder the circulation. The coronary arteries too were quite healthy. But the muscular substance of both ventricles was so soft as to be pierced through with the slightest pressure of the finger. The aorta was entirely free from all morbid deposits. Both pleuræ were free from adhesions and contained no fluid in their cavities. Both lungs were entirely healthy and so were all the abdominal viscera.

This case like the last presented nothing extraordinary in its mere symptoms. But it, like the other, had one extraordinary circumstance belonging to it; the short, even the shorter, period that intervened between the first paroxysm denoting the patient's disease and the last of which he died. In that case it was a fortnight, in this it was ten days only.

The next case I did not see. But I give its interesting and sad particulars from the best authority.

T. A. was within a day of completing his 47th year. Up to a very few hours before his death, both body and mind seemed equally to give proof and promise of health. He still took his accustomed pleasure and refreshment in strenuous exercise. His thoughts were still busily employed upon the highest subjects, conceiving and composing with wonderful ease, rapidity, and power. He retired to rest at midnight on the 11th of June, 1842, feeling and believing himself to be in perfect health. At a quarter before seven the next morning his medical attendant was called. What had previously occurred and what followed I will give in the words of Dr. Bucknill who was with him during the short remaining period of his existence. "On my entering his room he said that he was sorry to disturb me so soon; and that he had not sent for me before, thinking that it would go off. He added, 'I have had very severe pain in the chest since five o'clock at intervals, and it gets worse I think.' This pain was seated at the upper part of the chest towards the left side and extended down the left arm. He had been rather sick. He then asked me what the pain was. 'What is it?' He was now almost free from pain. His pulse I could scarcely feel. The tongue was clean. There was cold perspiration over his face. The feet and legs were cool. The breathing at this time not troubled. I gave him immediately some hot strong brandy and water, and having ordered a mustard plaster for his chest, till this was ready I applied hot flannels and had his legs and arms rubbed, and the feet wrapped up in flannels wrung out of hot water and mustard. The pulse became natural, the extremities more warm and he was free from pain. The mustard plaster was brought and put on. It was not large enough and I ordered another. The pain then returning I gave him more brandy and water, and it soon left him. And now he asked me again what the pain was. I told him I believed it was spasm of the heart. He exclaimed, 'Ah.' I asked him whether he had ever fainted in his life? 'No, never.' If he had at any time difficulty of breathing? 'No, never.' If any pain in his chest before? 'No, never.' I then asked him, if any of his family had ever had any disease of the chest? 'Yes, my father had; he died of it.' He inquired if disease of the heart was suddenly fatal? I answered that it was. 'Was it a common disease?' I said not very common. 'Where do you find it most?' 'In large towns I think.' 'Why?' 'Perhaps from anxiety and eager competition among the higher, and intemperance among the lower classes.' He was then quiet and free from pain and I proposed to leave him for a minute or two. He had no pain whatever in my absence. On my return the iration was still in drops upon his forehead. The pulse was again feeble and I gave him more brandy and water and had the flannels with mustard renewed. An attack of pain was coming on. He said, 'I must stretch myself.' I took one of his hands and held it until the pain was gone off. It was of short duration. I said, is it gone? He answered, 'Yes, entirely,' adding that he 'could scarcely bear it if it were as severe as it had been.' He then asked me 'what was the general cause of this kind of disease.'—He then said, 'is this likely to return?' I answered that I was afraid it was, but that, as the attacks had been less severe and less frequent, I hoped they would pass off. He next asked me if the disease was generally suddenly fatal. I said generally (for those who knew him were aware that it was impossible not to tell him the exact truth). I then asked him if he had any pain. He said, 'none but from the blister; one can bear outward pain, but it is not so easy to bear inward pain.' I was now dropping some laudanum into a wineglass, when he inquired what I was going to give him. I told him laudanum, Hoffman's anodyne, and camphor. And, while I was preparing the mixture and before I had finished, I heard a rattling in the throat and a convulsive struggle. I called out, and on turning to him I supported his head, which was thrown back, on my shoulder. His eyes were fixed and his teeth set, and he was insensible. His breathing was very laborious, his chest heaved and there was a severe struggle over the upper part of the body. His pulse was imperceptible, and after deep breathings at a few prolonged intervals all was over. He died in little more than half an hour after I first saw him.

"The examination of the body was made forty-eight hours after death, the weather being very hot. Its external appearance evinced rapid decomposition. It was discoloured and very livid in many parts. The skin was tightly distended with air, which was found in the cellular tissue throughout every part.

"When the right cavity of the chest was punctured a great quantity of air rushed out. The lungs on this side were healthy but their posterior part was gorged with blood and serum, and about eight ounces of bloody serum were found in the cavity of the pleura. On the left side were some old but not extensive adhesions of the pleura and about the same quantity of bloody serum was in this cavity as in the right. The lungs on the left side were healthy but more extensively gorged with blood and serum than on the right. Posteriorly they resembled soft spleen.

"The pericardium was healthy. It contained about an ounce of serum of a straw-colour. The heart was rather large. The external surface was healthy. It was very flaccid and flat in its appearance. It contained but little blood, and that was fluid. There were no coagula of any kind in it. All the valves were quite healthy, and so was the lining membrane throughout. The orifices of all the great vessels were quite natural. The muscular structure of the heart in every part was remarkably thin, soft and loose in its texture. The walls of the right ventricle were especially thin, in some parts not much thicker than the aorta, and very loose and flabby in their texture. Its cavity was large. The walls of the left ventricle too were much thinner and softer than natural. And the muscular fibres of the heart generally were pale and brown. The aorta was of a brown-red colour throughout its internal surface, probably from putrefaction. A few slight atheromatous deposits were observed in the descending thoracic aorta. The pulmonary artery was of the same brown-red colour with the aorta. There was but one coronary artery, and, considering the size of the heart, it appeared to be of small dimensions. It with some difficulty admitted a small director. It was slit open to the extent of nearly three inches. Its internal surface was red but healthy with the exception of a slight atheromatous deposit situate about an inch from the orifice of the artery. This however did not appear to diminish its cavity.

"The liver was pale and rather small; the gall-bladder was distended with yellow bile; the spleen was very soft and bloody.

"The stomach and intestines were distended with air. The kidneys were soft and rather bloody, and their surface presented in some degree the mottled appearance known by the term 'Bright's kidney.'

"The head was not examined. From the absence of all symptoms of disease in the brain to the last moment of existence there was no reason to believe that anything unhealthy existed in the head.

(Signed) "S. BUCKNILL. } Rugby.
"S. B. BUCKNILL, M.D. } Rugby.
"J. HODGSON, Birmingham."

But neither did this case present any thing extraordinary in its mere symptoms. Each paroxysm was a genuine paroxysm of angina pectoris and nothing more. But the rapidity with which one paroxysm followed another, and the very brief period between the first which declared the disease and the last which killed, these were indeed extraordinary circumstances.

Here then are three cases of angina pectoris. In the first we have death in a fortnight; in the second death in ten days; in the third death in less than three hours, from the first seizure. Now circumstances cannot be conceived more favourable than those which these three cases present for ascertaining the connection between symptoms declared in the living, and changes of structure found in the dead. The symptoms were essentially the same in all. They were few and striking and constituted of actions and sufferings which manifestly could, and manifestly did, cause death. They were also uncomplicated, no other symptoms interfering to spoil the simplicity of each case, before death arrived.

In the two last of these cases one structure of the heart and one only had undergone morbid change. Its muscular substance was reduced to an extreme degree of tenuity and softness In the first more than one structure had suffered. Its muscular substance was looser of texture than natural, but was not softened in any greater degree. Yet, moreover, its coronary arteries were entirely converted into calcareous tubes as far as they could be traced, and so was the whole aorta too. I have no doubt whatever that out of these states of disease arose the fatal angina in each case respectively.

But there is a much larger question which pathologists and physicians wish to settle.—It is this. Is there any form of organic disease which can be regarded as the efficient cause of angina pectoris absolutely and at all times; and if so, what is it?

Now let us look a little farther into the disclosures of morbid anatomy, and then, comparing what has been found in cases of longer duration with what we have seen in cases of rapid fatality, try whether we can come at any sure result.

The cases of longer duration are very puzzling in all that respects their morbid anatomy. Alterations of organic form and texture, which are very simple at first, come to be very complex in process of time. This happens especially with the heart. And, when in the heart the organic changes are many and belong to several structures, it becomes hardly possible to know what share we should assign to one, and what we should deny to another, in the production of certain symptoms during life. This happens especially in long-standing cases of angina pectoris. Some part of the complex disease found after death must (we conceive) have existed from the beginning, and been the efficient cause of the first paroxysm which occurred years ago, and of the last which occurred to-day, and of every paroxysm in the intervening period. But *which* that part is, who can tell without some clue to unravel the matter beyond what the morbid appearances themselves supply?

But in almost all the cases of angina pectoris on record death has been postponed for years, and in almost all, dissection has disclosed very complex disease of the heart and large blood-vessels. The three cases, therefore, which I have reported, become very interesting from their fatal rapidity. And perhaps they may have a further value from their simplicity, if they are found to throw light upon those numerous cases of the same disease, which are all too complex to be understood of themselves.

If in those, who die at a very early period after the first attack of angina pectoris, some one simple change of structure were uniformly found, and if in those, who die at more advanced periods, the changes of structure, though ever so multiform and complex, always included the simple form of organic disease, which belonged to the malady when it is more rapidly fatal, then would angina pectoris be fairly traced home to its efficient cause.

There are no cases upon record in which death followed the first accessions of angina pectoris so rapidly, as in those three which I have related. And if the disease essentially proceeds from any material element which morbid anatomy can detect, these were the cases in which to find it. You know what *was* found in these cases. Unfortunately for the success of our inquiry, not the same thing in all. Extreme muscular attenuation in two, and muscular attenuation of less degree conjoined with ossified coronary arteries and an ossified aorta in the third. But had there been simple ossification of the coronary arteries in all or simple muscular attenuation in all, yet could neither one nor the other be regarded as the proper efficient cause of angina pectoris. For though one or both are often traceable among the complex forms of disease found in those who die at later periods, yet one and both are often entirely absent.

What then have these cases, so new and interesting in their details, taught us after all? Truly nothing which, upon a comparison with other cases, goes to establish a purely organic or mechanical theory of the disease. But they have taught us much, very much, if, not looking beyond the actions and sufferings of the paroxysm, we regard them as constituting *the* disease. They have taught us that angina pectoris has a greater, an earlier, and more instantaneous power to kill than it was ever hitherto thought to have, and they have so far enlarged our knowledge of its clinical history, and have thus enabled us perhaps better to understand its real nature.

What then is its real nature? Dr. Heberden, after vast clinical experience of the disease (for he believed that he had seen more than a hundred cases), and after observation enough of it in the living man, reports "that it seems to pertain to *distention* and not at all to inflammation."*

Do not smile at this old-fashioned phraseology of Dr. Heberden or at me for quoting it. The writers of Dr. Heberden's time spoke of "*distention*" without any precise meaning. Not so Dr. Heberden himself; who in this place evidently meant by "distention" what we understand by spasm; and by inflammation evidently meant inflammation both in its progress and in its results, and indeed all that we understand by "*Organic Disease.*"

Then Dr. Heberden proceeds to give his reasons why angina pectoris "pertains" to spasm and not to organic disease, thus:—

1. It comes suddenly and goes suddenly.
2. It has long and complete intermissions.
3. Wine and spirituous drinks and opium afford great relief.
4. It is increased by mental agitation.
5. It exists for years without other injury of the health.
6. At first it is not excited by exercise in a carriage or on horseback, as is usually the case with scirrhus or inflammation (organic disease).
7. The pulse is not quickened in the very paroxysm.

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* Angina pectoris, quantum adhuc illius naturam intellexi, ad distentionem, non autem ad inflammationem videtur pertinere.

8. The paroxysm attacks some after their first sleep; a frequent event in diseases which proceed from spasm.*

Surely there is matter of fact and solid sense in all this. Nevertheless it does not prove quite as much as it was thought to prove. Grant that angina not merely pertains to, but is properly and essentially, *spasm*,—spasm does not necessarily exclude organic disease; spasm is a mode of action in muscular structures different from or beyond their natural and accustomed mode. It is in itself a thing essentially vital and has no necessary alliance with material conditions. It may be and often is altogether independent of organic disease. But organic disease may be and often is instrumental in producing it.

We seem here to be touching on the truth. Let us search a little farther in the same direction, and perhaps we shall find it. The paroxysm of angina pectoris is plainly a compound of pain and of something else. Of the pain there can be no doubt. But there needs must be something more than the pain to account for the dying feeling which attends every paroxysm, and for actual death in a paroxysm at last.

"Spasm," it has been said, "is a mode of action in muscular structures different from, or beyond, the natural and accustomed mode." The natural actions in all muscles, voluntary and involuntary, are unaccompanied by any conscious sensation whatever. But spasm is always accompanied with pain. And pain and spasm, wherever they are, disable the parts which they befall. Colic stops the peristaltic movements of the bowels. Cramp forbids the hands to handle and the feet to walk.

But the heart is a muscle, and its functions flow from its attributes as a muscle. Now we are in search of something in the heart which, as the concomitant of pain, may be disabling to its natural functions, and capable, according to its degree, of hindering or abolishing them altogether. This we find in spasm. In its spasm of smaller degree the heart fails to close freely upon the blood and to impel it freely into the arteries. In its spasm of greater degree it fails to project it altogether.

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* 1. Primo, subito accedit et recedit.

2. Deinde, longas habet et integras remissiones.

3. Tum, non contemnendam opem præbent vinum et potiones meraciores et opium.

4. Tum, perturbatione animi augetur.

5. Tum, multos annos molesta est sine alio valetudinis detrimento.

6. Tum, principio non excitatur vectione in curru aut in equo, ut fieri solet ubi scirrhus aut inflammatio est.

7. Tum, in ipsa accessione pulsus non concitatur.

8. Postremo, nonnullos adoritur post primum somni tempus; quod in morbis ex distensione frequens est.

Herein we discern an adequate explanation of the chief phenomena of angina pectoris. It is a spasm of the heart.

Review then the *circumstances* which have been recorded in connection with this disease. Many and various, perplexing and seemingly contradictory, indeed they were. But now they must begin to appear signally illustrative of its nature.

From what we know of pain and spasm, and the things causing and pertaining to them, in other parts of the body, we might be prepared for the same sort of things causing, and pertaining to, them when they belong to the heart. Thus we might expect to find angina pectoris incident to any form of organic disease of the heart, but constant to none. And such is the fact. We might expect to find angina pectoris where there was no organic disease of the heart itself, but such organic disease elsewhere as might injuriously interfere with the functions of the heart. And such is the fact. And finally we might expect to find angina pectoris, where there was no detectable organic disease either of the heart or of other parts, but where itself (namely spasm) constituted the whole disease; a disease purely vital, a disease of feeling and function alone, operating by and through sound structure, it may be fatally, always perilously. And such is the fact.*

I wish to add a few remarks upon certain mysterious cases of sudden death.

In a previous lecture I noted it among the hindrances of medical experience retarding its growth to perfection, that our observation was largely taken up with mere fragments of cases which do not in themselves contain enough to explain their own nature; and I observed moreover that "a single entire case often furnished the key to many fragments of cases."†

Many cases of sudden death often present themselves as mere fragments to our observation. Individuals are found dead. The mode of their dissolution and the circumstances just preceding it are unknown. And dissection after death does not clear up their mystery. Now some such cases have their nature explained by the very cases of angina pectoris before described, and are shown to hold a pathological kindred with them.

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* The fact is not within my own experience; but I must admit what is credibly reported.

† Page 346.

R. P. was about fifty-five years of age. He had filled a high judicial office in India, and when his stated period of service had expired, he returned home with unimpaired health. Ten years had wrought little change in his person, except that, from having been thin and muscular, he was slightly tending to fat and corpulency.

He had now been more than a twelvemonth in England, and had taken up his residence in Hampshire, and was in the enjoyment of his wonted health, when one day, after a morning's shooting without any extraordinary fatigue or exertion, he felt at dinner an unusual pain in the region of his heart. The pain was not extreme, but enough to make him leave the table and retire into his library. Warm applications were made to the chest, and the pain soon ceased altogether. He then begged that he might be left alone to repose until tea-time. In less than an hour his wife returned into the room, and found him lying upon the sofa just in the position she had left him. She believed him asleep, but found him dead.

The examination of his body, as it was reported to me, disclosed nothing that could account for his death, but a thin fat heart; fat was deposited upon it at the expense of its muscular substance. Here the very manner of the patient's dissolution was not witnessed. The symptom last observed was pain immediately referable to the region of the heart; but it was not of an extreme amount: probably it returned in a more severe degree at the time of dissolution.

Now this case may be fairly interpreted by the case last described, in which there was a complete observation of all that *vitally* constituted the disease. There all was comprised in pain; pain occurring under the conditions which bespeak spasm, and that of the heart. Here too all that was observed was pain; and it is likely that what was not observed was still nothing else but pain, and that it directly proceeded from spasm of the heart, and that the patient died in the first paroxysm of angina pectoris.

P. W. M. was seventy-three years of age. The whole course of his life had been singularly exempt from illness. For many years he had been employed in a regular routine of duties belonging to a government department. In the course of the few last years he had consulted me three or four times for slight complaints of the stomach, and thus gave me the opportunity of learning that his pulse was habitually very small and very feeble. One winter, when bronchial catarrh was very prevalent, he did not escape the general malady. He was not very ill, but ill enough to make it prudent for him to keep his bed for three or four days, and then for a few days more not to return to business. In little more than a week he was so nearly well that I discontinued my attendance. The last day I saw him he made light of his past illness and ridiculed the care which had been taken of him. At night he retired to rest apparently well, and the next morning was found dead in his bed, and cold. On examination after death nothing notably wrong was found within the brain, nothing within the lungs, nothing within the pleuræ. The bronchi, to which the symptoms of his past illness belonged, presented nothing remarkable. But the heart was very small in all its dimensions, its muscular substance altogether very thin and very soft without being fat, and both its coronary arteries, as far as they could be traced, were mere bony tubes.

Here the symptoms immediately preceding dissolution were unobserved. It is probable that he died of a first paroxysm of angina pectoris, of a first spasm of the heart.

I was curious to learn whether this gentleman had ever in his life been known to suffer anything approaching to angina pectoris. But I could not find that he had. There was however one remarkable circumstance about him which was probably connected with the feeble structure of his heart. He was strangely averse from bodily exercise. His residence was in the neighbourhood of Russell Square, and his business in the City. But he never would walk to his office if he could help it. When he was in the country he would be in the open air from morning to night, but never on foot, always on his pony. In all this he might have been unconsciously favouring his feeble heart.

LECTURE XXXVIII.

ANGINA PECTORIS CONTINUED. — ITS CLINICAL HISTORY AND TREATMENT.—CONDITIONS TO BE NOTED IN THE INTERVALS OF ITS PAROXYSMS.—PARALLEL BETWEEN IT AND EPILEPSY RESPECTING THEIR TREATMENT. — MANAGEMENT OF THE PAROXYSM.— WHAT AUSCULTATION TEACHES.— WHAT THE VARIOUS CIRCUMSTANCES OF ITS CLINICAL HISTORY.

THE cases already given offer a striking representation of angina pectoris in what concerns the paroxysm, displaying its essential conditions and its fatal tendency. But they are extraordinary cases. And extraordinary cases are often merely curious, and interesting only because they are curious. But sometimes they are interesting, because they furnish rare and fortunate opportunities of instruction, filling up gaps in our knowledge, or fortifying it with new proofs, and so giving it a higher degree of certainty than it had before. Thus the cases which have been recited seem to carry us a little beyond our former knowledge of angina pectoris.

In the last lecture it was almost taken for granted that the assemblage of symptoms constituting angina pectoris was to be found by turns in connection with all forms of unsoundness which belong to the heart. The fact, you may perhaps think, should rather have been verified by an appeal to numerous cases and dissections, especially since it was a good deal relied upon as a basis of our reasoning. But this would have been a long business. Let it then be enough for me now to refer you to a source, where this very fact is authenticated, and where indeed the whole learning of our present subject is set forth with admirable accuracy and comprehensiveness.*

My purpose however is to take what I have myself seen, and to comment upon it as I would upon cases in the hospital. Have I then any thing more to say of the mere paroxysm of angina pectoris? Thus much only; 1st, that in different individuals and in the same individuals at different times the period of its duration is apt to vary. It may come and go and be all over in a minute. Or it may last many minutes, even a quarter of an hour. Or it may be protracted for half an hour or an hour. 2ndly, that the two elements (so to speak) of which the paroxysm consists, are apt to vary proportionably to each other. The pain and the dying sensation may be equal in degree, and both may be extreme. Or in different individuals and in the same individuals at different times the one may exceed the other. The dying sensation, however, I have more frequently found to surpass the pain than the pain the dying sensation.

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* Encyclop. of Practical Medicine, Art. Angina Pectoris, by John Forbes, M.D.

Nothing more need be said of the paroxysm in the way of description at least.

But is not angina pectoris a disease altogether of paroxysms; and when we have learnt what the paroxysm is, have we not learnt everything? Why, no! There still remains its clinical history and all the circumstances prior, predisposing and conducive to it; and these, when we come to its treatment, must engage our attention more, far more, than the paroxysm itself.

For only let us consider, and we shall find this to be the common condition of almost all diseases which consist in distinct and separate paroxysms, namely, that their treatment, whether it aim at postponement or mitigation or absolute cure, is occupied not with the paroxysms themselves but with circumstances which appear in the intervals between them. Take epilepsy for example. In the attack itself our chief care is to protect the patient from injury. I do not know that we either can, or pretend to, do any thing for the mere convulsions. It is when the convulsions are over that we seek for indications to guide our remedies, and that we betake ourselves to the proper business of medical treatment. It is then, that we watch the brain in its habitual and daily operations both mental and physical; and that we watch too all those organs especially with which the brain holds a more obvious relation of function and sympathy, the heart, the kidneys, the stomach and bowels, and learn whether all is right, or what is wrong, with them. It is then, that we note well the habitual state of the vascular system, whether it be plethoric or anæmic, and of the nervous system, whether it be torpid or excitable. We seek in all these organs and systems of organs for actions or sufferings which may be more or less, nearly or remotely, conducive to the epileptic paroxysm; and wherever we find them we minister to them. Moreover we are, above all, inquisitive after any notable circumstance, within or without the body, immediately preceding the paroxysm, which can have force to call it forth.

Thus we address ourselves to the treatment of epilepsy. And we address ourselves to the treatment of angina pectoris in like manner.

As to the attack itself of angina pectoris, it is very much more an affair of life and death than is the attack of epilepsy, and so there is more room and more need for our interference with it. But for what purpose is our interference? For the purpose rather of saving life than of treating the disease. For say that we do save the patient's life in the paroxysm of angina pectoris, (a great thing truly to be able to say,) yet when his paroxysm is over, it is not at all less likely to return because we have saved his life for the time being.

The paroxysm indeed has its proper management, which must be considered; but the real treatment of angina pectoris, whether it look to mitigation or postponement, or even contemplate the possibility of cure, concerns itself with things which are to be ascertained leisurely in the intervals between the attacks.

As in epilepsy, so in angina pectoris, we first inquire into the habitual state, as to function and structure, of that organ from which the paroxysm, when it arrives, directly proceeds. We now seek to know all we can about the heart, as we then did about the brain; and next all we can about the blood-vessels immediately springing from the heart: and then about the whole vascular system, whether it be plethoric or anæmic; and then about the nervous system, whether it be torpid or excitable. And the stomach and bowels and their subservient viscera we scrupulously watch. And lastly in angina pectoris, even more than in epilepsy, and more than in any disease of paroxysms, we desire to come at a sure knowledge of the conditions, which in each particular case are apt to call forth the attack, whether they proceed from the body or the mind, or from meats and drinks, from within or without, from things that can be avoided or things that cannot.

Here then is the whole subject put in *working* form and order. Let us see what we can make of it, when we come to apply our remedies.

First for the paroxysm itself. Now the truth is, we seldom witness the paroxysm. We are summoned; but it has passed away before we arrive, except in some instances of its unusually long duration and great severity. Indeed the patient has almost always either to treat it for himself or trust to whoever may be at hand to help him. The patient then, that is, the person who has once suffered an attack of angina pectoris and is almost sure to suffer it again, the patient himself and those about him must be instructed how to be prepared for it and what to do when it arrives.

The two constituent elements of the paroxysm, the sense of dissolution and the pain, have each their appropriate remedy.

The sense of dissolution calls for those stimulants which take effect in the quickest way, for æther and ammonia. Æther can fetch up life from a deeper prostration than all other stimulants, and therefore it is to be chosen in the greatest extremity. Hoffmann's æther and spiritus ammoniæ should always be within the patient's reach, and, when the attack comes on, a teaspoonful of one or the other or of both together should be given, just so much diluted with water as will allow them to be swallowed. If the paroxysm do not cease the remedy must be repeated in a few minutes. If it cease and return, the remedy must equally be repeated. And so on again and again, while the threatening of dissolution continues, or while it is going and returning. There is no need of being more explicit. The emergency indeed is great, but its management is plain enough. The simple purpose is to keep life going until the paroxysm is over.

But the other element of the paroxysm, the pain, has, it was said, its appropriate remedy. True; but before its appropriate remedy has time to reach it, the paroxysm and its pain are commonly both gone away together. When however the paroxysm is protracted for a quarter of an hour, or for half an hour, or for a whole hour and more, or when it goes and comes again at brief intervals, then its sharp agonising pain, continuous or recurring, is to be treated *as pain*. And then any other remedy is utterly useless but opium. There is a strength and a prevalency in the pain of angina pectoris which nothing but opium has the power to master. A drachm of laudanum must be given with the æther; and given again in a quarter of an hour, if it have made no impression on the pain; and yet again in another quarter of an hour, if the pain have not yet ceased, or have ceased and returned in all its strength.

And now, when the paroxysm, be it of more or less peril, of longer or shorter duration, treated by us or treated by the patient himself, is past and gone for the present, our task as physicians is only beginning. For now we must proceed to learn why it ever took place at all, and provide, if possible, that it never shall take place again, or that it shall be mitigated or postponed.

Having witnessed such a formidable assemblage of symptoms, and knowing that they spring from the heart, we betake ourselves at once in every instance to inquire into its condition. We are indeed well aware of the conclusion, justly drawn from a summary of results furnished by numerous cases, that there is no certain form of disease or disorganisation of the heart to which angina pectoris necessarily belongs, but that it is incident to many, if not to all. Nevertheless the form with which it is found in alliance, must be that from which it is derived, in each particular instance. Therefore in each particular instance we should seek to learn what it is; to learn, I mean, during life, so far as by its sounds, its resonances, and its impulses the heart can declare its condition. This knowledge, which comes chiefly from auscultation, may or may not advance our knowledge of angina pectoris absolutely beyond the point where morbid anatomy has left it. What it really does, we shall see presently. It may only assist our treatment of the case in hand. But whether it do so or not, our duty is to ascertain all that is ascertainable for the chance of good which may come, from our more perfect acquaintance with his case, to every individual patient.

Observe, however, before we proceed further (what it is most important to bear in mind) that in angina pectoris auscultation is not applied to the diagnosis of the disease. The disease is a certain assemblage of symptoms, and not any constant pathological condition belonging to the structure of the organ. Therefore when auscultation detects now this, now that, pathological condition of the heart or of the large blood-vessels in different cases, it does not reach *the disease* but only *circumstances* of the disease. It does not reach its clinical *diagnosis* absolutely, *but* only a part, yet an important part, of its clinical *history* in the individual.

Let me now take the last thirteen cases of angina pectoris which occurred to my observation, and see what it was that I made out, by examination of the chest, in the intervals between the paroxysms.

In three of the thirteen cases, the præcordial region presented the usual extent of resonance to percussion; while the impulse of the heart was most feeble, and not to be felt in the least degree beyond the point where its apex strikes the ribs. Its sounds were perfectly natural in kind, but raised to their highest intonation and diffused over the entire front of the chest, but not conveyed along the aorta. These signs, the defective impulse, the far spreading and excessive sound and the perfect resonance of the præcordial region, plainly denoted some change of structure in the heart which brings loss of power. They implied simple atrophy and attenuation of its muscular substance.

In other three cases, the præcordial region was altogether dull to percussion; and the imperfect resonance extended as far as the right mamma. The impulse of the heart was very feeble. Its sounds were (as it were) muffled and dull with scarcely a perceptible distinction between the two. They were heard all over the front of the chest and in the left axilla but not at all in the aorta. In one of the cases the beats of the heart were irregular; in the other two they were rhythmical. These signs too denoted some change of structure in the heart which brings loss of power; but it was not *simple* atrophy and attenuation of its muscular substance. Such atrophy and attenuation there might be. But the bulk of the organ was augmented withal; augmented however by the addition of something which was a source of weakness; most probably of fat. The general habit of the patients confirmed the suspicion.

Again, in other three cases the natural sounds of the heart were lost, and changed into (what we have called) endocardial murmurs. These murmurs were very loud, and were heard equally at its apex and its basis, and in all the præcordial region, and diffused widely over the chest in front, and conveyed along the aorta and the subclavian and the carotid arteries. Thus by their kind, by their extent, and by their direction they sufficiently declared, in all three cases, an unsoundness both of the mitral and of the aortic valves, while by their loudness they showed that the impediment at the orifices was as yet but small. In one of these cases the impulse was very feeble and defective, while the præcordial region was duly resonant to percussion, showing that the heart had lost in power, and probably lost in bulk also, by simple atrophy and attenuation of its muscular substance. In another the impulse was very feeble and defective, while the præcordial region was dull to percussion in an undue extent, showing that the heart had lost in power and gained in bulk, probably by the addition of fat. In the third there was no sign present to denote that the heart had undergone any change of structure beyond unsoundness of the valves.

In the four remaining cases there were unnatural murmurs, but they appertained rather to the blood-vessels than to the heart itself.

In one of them all that could be found was a slight systolic roughness at the commencement of the aorta, present at all times and heard running across the sternum to the right; and, during exspiration only, heard running towards the left clavicle, and augmented into a real bellows-murmur. Nothing different from what is natural could be detected in the heart itself. Here there was no sure sign of disease but in the aorta.

In another of them both sounds of the heart in the præcordial region wanted something of being natural, yet fell short of the endocardial murmur. But the murmur became distinct and very loud above the semilunar valves, and still louder in the course of the aorta, and was clearly audible in the subclavian and carotid arteries of both sides. The heart beat with some slight excess of impulse while the præcordial region was duly resonant. Here the only detectable disease was in the aorta. Whether the heart's small excess of impulse was due to a small hypertrophy or to an abiding irritation imparted to it by a near impediment of the circulation cannot confidently be told.

In another of them no unnatural sound whatever was heard in the præcordial region, but a murmur began to be audible just opposite the semilunar valves, and became louder and louder beneath the sternum in the direction of the right subclavian, and it was still loud in the right carotid; while in the left subclavian and left carotid no murmur whatever was heard. It was distinctly diastolic and systolic by turns. When the pulse was irregular, as it almost constantly was, then the murmur was diastolic; when it was regular, as it sometimes would be for half a minute, then the murmur, for that half minute, would become systolic. The heart's impulse exceeded neither its natural degree nor extent, but there was some undue measure of dulness to percussion in the præcordial region.

In another of them a very faint endocardial murmur at a small space near the basis of the heart became loud opposite the origin of the aorta, and louder beneath the upper part of the sternum, and loudest of all in the left carotid, where there was no extraordinary impulse; but it was scarcely audible in the right carotid, where the impulse was excessive; very loud in the left brachial, where the impulse was very small, and scarcely audible in the right brachial, where the impulse was very great.

I have preserved no record, in this last case, of the heart's impulse within the chest, or of the resonance or dulness of the præcordial region.

In these two last cases, the auscultatory signs denoted rather disease of the aorta and of certain arteries springing from it than of the heart itself; and moreover they denoted that it was so situated as to make a difference either in the quantity of blood which reached the two sides of the body, or in the force with which it circulated in each respectively.

Thus in each particular case of angina pectoris I have sought (and thus you must seek) to come at the knowledge of what was really wrong at the source of the circulation, if perhaps I might be enabled to administer more appropriately and effectually to the patient's relief. And after all I hold it but honesty to confess that my clinical labours pushed in this direction have had no such fortunate reward. The details which have just been given are interesting enough, and they could not be spared. But consider what they are, and recollect what has been said in former lectures of these and the like forms of unsoundness in the heart and in the blood-vessels respective to their treatment. The heart that is simply attenuated and the heart that is fat; unsoundness of the sigmoid valve and unsoundness of the mitral; of the aorta and of its branches: these do not, you well know, ask each its own mode of treatment. In truth they none of them admit of any treatment *for* themselves, but only for some of their effects *beyond* themselves.

Thus the light thrown by auscultation upon the assemblage of symptoms constituting this disease called angina pectoris is, as far as it goes, just the same as that which proceeds from morbid anatomy; but it reaches us sooner. For auscultation is the anticipation of morbid anatomy. The one tells us during life what the other waits to tell us after death.

But I say "as far as it goes." True it is, that the light from auscultation in this affection is the same as that from morbid anatomy, and that it reaches us sooner; but *it does not go so far*. For there are conditions, to which angina pectoris is often annexed, incapable of being surely known until death. Such are certain changes, both pathological and abnormal, of the coronary arteries, disturbing or arresting the current of blood within them.

But beyond the heart, the aorta, and its branches within the chest, we must look to the vascular system everywhere, when we have to do with a case of angina pectoris. And what is it that we are likely to find there? Surely not the first spring of the disease, but something that may minister to the return of the paroxysm, and which consequently may become an indication of treatment with a view to it.

The paroxysm is often put off and its severity mitigated and life prolonged by no means more surely than by keeping the vascular system in a just balance between fulness and emptiness, between rich blood and poor blood. In some constitutions, very happily born, the balance maintains itself; and then there is no need of interference on our part. In the majority it is not exact, yet exact enough for the ordinary purposes of health, but not enough when there is some grave infirmity to be palliated and made tolerable elsewhere. A small habitual deviation on this side or that is readily felt and resented by the heart, when it has undergone some form of unsoundness rendering it obnoxious to spasm.

Thus there have been cases in which my treatment of angina pectoris, in the intervals of the paroxysms, has chiefly turned upon reducing the nutritious and stimulant quality of the patient's diet, abridging his animal food, and denying him wine and fermented drinks altogether. There was one case, and only one, in which I was driven to draw blood even more than once from the arm; an unusual and a hard necessity! There have been more cases, on the other hand, in which the general habit of the patient has made me fearful of withdrawing support, and experience has shown me the need of supplying a well-regulated amount of stimulus in the shape of wine daily. The administration of steel in the intervals of the paroxysms has (I have convinced myself) in some instances been instrumental to their postponement.

Truly a volume might be spoken upon the subject, if one were to enter into the detail of all the indications, which the general vascular system may offer to the observant physician, for the employment of remedies as a safeguard, within all possible limits, against the attacks of this awful disease.

And truly the same may be said of the nervous system, and how it notifies indications of treatment by its various states of disorder; and how it presents itself as an avenue for remedies, which may carry a salutary impression to the heart and withhold it for a time from falling into spasm. Loss of sleep, disturbed sleep, and painful irritation and troublesome wants, such as frequent micturition, may be among the bad habits of the patient, or they may be induced by his disease, or they may be aggravated by it. At all events they contribute to bring on the paroxysm more frequently and more severely. It is wonderful what a small quantity of opium, administered dexterously upon such indications, will sometimes do in keeping angina pectoris from advancing to a greater degree of suffering, or in bringing it back from a greater to a less.

The following case carries this piece of instruction with it at least. A gentleman had for years been the subject of angina pectoris. He called upon me occasionally. I learnt that hitherto the paroxysm had always come on in the day, and always from some known exciting cause. But now he told me that for two months it had also come on in the night, and independent of any cause which he could discover. The attack was after this manner. He woke in the middle of the night according to his custom, and made water. Thus far he was free from pain.

But in ten minutes afterwards he perceived the pain coming on. It soon spread all over the front of his chest and ran on rapidly to an agony. He had taken sulphuric æther in the paroxysm, which gave him present relief, and that was all. I ordered him in addition to the æther a drachm of paregoric on his going to bed every night, and again on his waking and before he began to move. From that time forth, for more than three months, the nightly paroxysm never returned. Such sometimes are the great effects of (what are thought) the little things of medical practice!

These conditions, which belong to the vascular system and to the nervous system respectively, are for us physicians to observe and to appreciate. But the patient by his own experience finds out unerringly what in himself is the immediately exciting cause of the paroxysm of angina pectoris. Bodily exertion is the most frequent, and the most certain. In the vast majority of cases upon record the first paroxysm has arisen while the man was making some strenuous effort. He was lifting a weight, or he was walking up hill, or he was making way against a high wind, when suddenly pain stabbed him through the chest, and he was ready to drop down dead. But he stopped, and instantly recovered. Both the pain and the death-like feeling ceased at once and altogether, and he was quite well again.

The first paroxysm of angina pectoris, though it may be an affair of a minute only, never failed to carry alarm to the stoutest mind. "A little more," he says, "and I had been dead." But weeks and months often pass, and time almost wears out the terror of the first before the second paroxysm arrives. But the second comes at last, and just under the same circumstances as the first. Again a long interval will often succeed before the third paroxysm takes place under the same circumstances as first and second.

In a matter so fearfully interesting to himself the patient soon gets a clear notion of cause and effect. A few such paroxysms read him a severe lesson of instruction; a practical and a profitable lesson however; for he learns the great secret of his own treatment. He learns that there is a point of bodily exertion which he cannot exceed with impunity, and so he becomes perpetually on his guard to keep within it. And thus when the exciting cause of angina pectoris is so plain and the motives for watchfulness are so strong, even as strong as the love of life and the fear of death, and when, above all, a man's circumstances are such as allow him to take as much care of himself as he pleases, many years, even ten or a dozen, have been known to elapse between the first attack and the patient's death.

There may be something peculiar in the kind and degree of bodily exertion which the patient can or cannot bear, as the following case will show. T. N. W. was a specimen of a country gentleman which would seem to belong rather to the past generation than the present. Field sports had been his business, his passion and his pleasure, all he lived and all he cared for, for forty years. He was always on horseback and always in the open air; and, whenever the hounds were out, it was a lost day with him if he was not out with them. The longest run could even yet no more hurt him than the youngest man in the field. He was now in his sixty-fourth year, when he consulted me for an affection which he had suffered at intervals for five months. It was five months ago, when walking up hill he was seized with a sudden pain at the lower part of the sternum and with a strange deadly sensation besides the pain. He stopped; and immediately he was well again, and able to walk on. From that time forth he could never walk up a hill or use any extraordinary exertion without a return of the same pain and the same deadly sensation. And, finding they never came on spontaneously, he had learnt to be very circumspect not to exceed such bodily efforts as he could bear. He was sure, however, that the exertion needed to produce them was becoming less and less, and he gave me this characteristic proof of the fact. At first he could hunt as well as ever; and indeed so he could still, but then he must take care not to ride "the grey mare." Even now he could gallop any horse he had except "the grey mare." But of late "the grey mare" had been too much for him.

Here was a man, well knowing, from what his own feelings told him, that an excess of bodily exertion might kill him, and ever careful to avoid it, who was yet not afraid to get on horseback and follow the hounds. The fact was, habit had made him so entirely one with his horse, that all *fair* riding was to him much the same thing as being rocked in an arm-chair. It was only when he found himself upon some hard-mouthed beast, that he found his energies really called upon.

It is remarkable how men, whose life is threatened by every attack and so in perpetual jeopardy, will often continue to bear the aspect of perfect health for years and will die at last in some unfortunate paroxysm, before half their friends, who were unacquainted with the secret of their malady, ever knew them to be ill. And thus it was, because angina pectoris is compatible with both the appearance and reality of health in the intervals of the paroxysms, that one good man, whom I knew, fully understanding the nature of his malady and convinced that he might die any moment, contrived, from motives of tenderness to their feelings, to conceal the fact from his wife and family to the last.

Contrasted with such specimens of angina pectoris, showing that a man may live long with this disease and live too in the repute of health, and die of the same and be believed to the last (except by himself the sufferer and those who have seen him suffer, or have otherwise known the fact) to be a sound man by all the world; contrasted with such specimens there are others in which the paroxysms acknowledge the same exciting cause from the beginning and in which men live long, but they have no long intervals of real or reputed health, and are obliged by hard necessity to adopt the daily caution and conduct of invalids. For they find that less and less of bodily exertion calls forth the paroxysms; that more things must be avoided; that more vigilance is needed; that still in spite of all vigilance the paroxysms become more and more frequent, until at length they seem to arise either independent of any exciting cause at all or of any that is apparent or appreciable.

But bodily exertion is not the only exciting cause of the paroxysm. It is probably the most frequent. And well it is, that it should be so; for it is most within the power of the will to measure and to restrain. But in the same individual there are often more exciting causes than one. Passions and affections of the mind are wont to show their power over the body especially by the manner in which they influence the heart, even the healthy heart; rousing it to tumultuous and irregular action and engendering pain within it. And they show the same more conspicuously by the greater force and frequency with which they actuate the heart in its states of disease. Be its disease what it may, and the modes of disordered action and suffering annexed to it, what they may, the mind by its feelings and its impulses can aggravate them and multiply them. It can do so, and often does, in angina pectoris.

Now the will, I fear, is far less master of the mind than of the body. A man may resolve never to move from his chair, but he cannot resolve never to be angry. Thus many a subject of angina pectoris, who by skilfully measuring and limiting the movements of his body by what he can bear, has been able to abate the frequency and severity of the paroxysms and so to prolong his life for years, has in an unhappy moment been surprised into anger and died at once.

And so I believe that in angina pectoris death has followed mental excitement more frequently than bodily excitement. The latter may indeed be the more potential cause of the paroxysm, but the former it is more difficult to guard against.

Nothing can be more plain and palpable, in the nature of an exciting cause, than are bodily efforts and mental impulses provoking pain and cramp of the heart, when the condition of the organ predisposes to them. Thus a fall or a blow has not more surely been known to kill a man than has a sudden surprise of anger or a sudden movement from his chair.

But there are causes (I mean exciting causes) more from within and less obvious but not less real, which can make the healthy heart flutter and palpitate, and lead the unhealthy to any modes of action or suffering which belong to its present disease. They may lead it to angina, *i.e.* to pain and cramp, and so to death; it may be to sudden death.

Experience is ever at hand to show what a bad stomach and bad digestive organs can do in making the heart beat irregularly, though it be sound of structure all the while. I have known people suffer irregular action of a sound heart all their lives. It has been mitigated occasionally to a great degree. It has been aggravated occasionally to a painful amount. But it has never entirely ceased for any considerable period, because it has arisen from a faulty digestion, which has been at one time better and at another time worse, but has never been remedied altogether. And experience is ever at hand to show, when the heart is unsound of structure, that whether the stomach and digestive organs be good or bad, they must have abundant care bestowed upon them both by the patient and the physician. Every case of unsound heart we meet with still enforces the same lesson, that the apetite must be denied, and meats and drinks scrupulously chosen and scrupulously measured, and evacuations duly obtained, if we would practice the best methods of mitigating evils which we cannot cure.

In angina pectoris, whatever be the form of the heart's disorganisation upon which it essentially depends, if life be long spared, experience gradually grows upon the patient and the physician of more and more conditions conducive to the paroxysm. Sooner or later the one feels and the other knows that it may be excited by the state of the stomach.

Seldom at first can it be imputed to any obvious cause but undue bodily exertion. And seldom still for a considerable period (perhaps for months, perhaps for years) can it be imputed to anything beside this undue bodily exertion and sudden or strong mental agitation. If the patient be blessed with healthy digestive organs, and, withal, be habitually, from choice or from principle, careful and temperate in his diet, then, though the paroxysm continue to recur from these two causes, it is long before any other than these can be accused of any share in producing it.

But, be the digestive functions ever so vigorous, if the patient be one of the unfortunate many who never knew experimentally what strict temperance means, then a new exciting cause of the paroxysm is soon apparent. Simple repletion is soon found capable of bringing on an attack of angina pectoris. And, should the digestive functions be naturally feeble, and the patient be the victim of habitual and extreme dyspepsia, then much sooner, even almost as soon as the malady declares itself, does the new exciting cause become manifest, and thenceforward the paroxysm is found to proceed as frequently from the stomach as from any other source.

Mere dyspepsia has in some rare instances been the sole apparent cause conducing to the paroxysm: and extreme care in meats and drinks has postponed it so successfully and for so long a time as to induce a persuasion that the whole malady was nothing more than an intense sympathy of the heart with a disordered stomach.

The late Dr. Richard Pinchard told me that his uncle, who had suffered unquestionable angina pectoris, made out distinctly that each attack was induced by disorder of the stomach. Hence it became the business of his life to take care of this organ, having before his eyes the frightful penalty he might pay for neglect of it. And he succeeded so well that for years and years he did not suffer a single paroxysm. He might well believe, as he did, that the heart was sound, and that his angina pectoris had been an affair simply of its sympathy with the stomach. But at length he was found dead in his library, and on examination the heart turned out to be large and dilated, and its coronary arteries extensively ossified.

There is yet another circumstance which deserves to be mentioned in the clinical history of angina pectoris, namely, its real or supposed connexion with gout. It needs but small professional intercourse with that class of invalids which is well off in the world, to know what a large space gout occupies in all their speculations concerning their own personal complaints. They who have once had gout themselves or have any hereditary claim to it, are ready to see it in every thing they suffer, small or great, ailment or disease. And indeed, when they have such patients to deal with, medical men themselves are apt to glide into the popular theory, and to make a great expenditure of colchicum upon diseases which they do not well know what to think of or how to manage.

Sober experience, however, cannot deny that there is some truth in these notions. The question is what and how much truth. And this question I for one will not pretend to settle.

Now in genuine angina pectoris, I have been asked by patients at my first interview with them, "Don't you think it is gout?" And some have put the question from a mere groundless fancy, and others from something more reasonable.

One who had seen some service in the navy, and was now an admiral, had his first attack of gout at the age of 35; and for the eight following years he never suffered it again. Then for the next thirteen years he had it very frequently and very severely; the attacks returning perhaps several times in the same year. He was now in his 56th year. And in this year he experienced his first paroxysm of angina pectoris. The paroxysms, varying in frequency and severity, continued to recur for five years. But from the first paroxysm of angina through the entire space of the five years he had had one attack only of gout. Now, pray do not ask me to give you the reason for all this. I have no profound piece of Pathology that will help me to account for it from the nature of the two affections. Yet I think I see in the circumstances of the particular case an explanation perhaps sufficient to satisfy common sense.

From the time that the angina first appeared, the patient, who all his days had been a generous liver, submitted implicitly to the most exact and rigid temperance. He ever afterwards drank nothing but water, and ate only the lighter kinds of animal food, and those most sparingly.

This discipline was aimed at the angina; and it succeeded in mitigating and postponing its paroxysm. But cure the angina it did not; and it was never expected to do so. But cure the gout it certainly did, as it might naturally be expected to do. For the very same discipline has oftentimes been known to cure gout, where there has been neither angina nor any other disease to supersede it, and so to claim the credit of being its remedy.

But I have heard of gout and angina pectoris alternating with each other in the same subject; when there has been more of gout, there has been less of angina; and when more of angina, less of gout. This is not an affair of my own observation, but I can well conceive it to have happened. It has probably been in the cases (already alluded to and said to exist) where the angina has been an affection purely vital, and the heart has suffered pain and spasm, though perfectly sound of structure. That such an angina should germinate from the same root as gout is not unlikely. They might both spring from some inveterate fault of the assimilating processes. As long as this fault was unredressed, one or other or both might continue to exist by a sort of pathological necessity: thus whichever happened to predominate would become for the time a natural substitute or compensation for the other, whether it were gout for angina or angina for gout.

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